PSYCHE

VOL. II, No. 3. NEW SERIES: JANUARY, 1922

EDITORIAL

IN this number we publish two articles dealing with the psychology of Æsthetics; one, by Dr. Watt on Music, the other by Mr. C. K. Ogden and Mr. Wood on the analogy between Sound and Colour.

We are sure that both these articles will be appreciated by all who are interested in Æsthetics, especially by those who believe that the artist and the psychologist can make useful contributions to each other's knowledge.

For our own part we are confident that closer co-operation cannot fail to be of the utmost value to both parties, and the subject is one to which we hope to do full justice in future issues.

The relation between Art[1] and Psychology is two-fold. In the first place artistic endeavours or appreciations are an extraordinarily valuable guide to mental character, whether in an individual or a nation;[2] in the second, no theory of æsthetics and no standards of criticism are of any value unless they are built on a psychological foundation.

There is too great a tendency, especially among devotees of the arts, to imagine that Art is something so mysterious and elusive, so remote from the ordered realm of scientific thought, so essentially pertaining to another world, that it is absurd to reason about it or to seek for the laws which govern it.

The result is the writing and talking of an immense amount of nonsense on the subject, and a tendency to

[1] By this term we intend to refer to all forms of æsthetic activity, whether in literature, music, painting, dancing or otherwise.

[2] Cp. Professor McDougall's *National Welfare and National Decay* reviewed elsewhere in this issue.

despise as uncomprehending Philistines those who attempt to reason clearly about it.

In order to bring about a more satisfactory state of affairs there is needed a wider realisation of the fact that any artistic production is only of value—and indeed may reasonably be said only to *exist*—in so far as it reacts on and produces some effect in a human mind.

In the absence of this human and essentially psychological context a poem is no more than an assemblage of marks on paper, music is a mere disturbance of the air, painting is only the reflection of light from certain chemicals.

And if enquiry be made as to the essential feature of this reaction between a work of art and the human mind, the answer must be found in a consideration not of the bare sensations, visual or auditory, which that mind receives, but of the emotional states which accompany them.

This we think will be universally conceded, but the more intricate question then arises as to whether these emotional states are identical with some of those aroused by other than æsthetic causes, whether they are—if we may so express it—made up of the same ingredients, but characteristically proportioned, or whether they are of a wholly distinct order.

Of these alternatives we conceive that the third is the least accurate, and the distinction between the first and second is only valuable if the "emotions" are regarded as sharply defined states discontinuous with each other.

Such a view would not be maintained by many modern phychologists: on the contrary there seems to be ample reason for believing that every emotional state is compounded of elements which may be present in infinitely varying proportions according to the precise nature of the total contemporary situation. And since no two such situations can ever be identical it follows that no two emotional experiences are quite the same, although sufficiently strong resemblances may be noted to justify a rough general classification.

If this is so, if the distinction between different "emotions" is one of degrees rather than of kind, it seems illegitimate to make a unique exception in the case of emotional states induced by "æsthetic" experiences.

From these premises various conclusions may be deduced.

It is clearly impossible, for example, to draw any sharp dividing line between objects or experiences which are æsthetic and those which are not; it follows also that the emotional effect produced by any given work of art must be at least slightly different in the case of every individual; hence canons of Art and standards of criticism can be formulated only with regard to the known mentality of individuals or the average mental characteristics of groups, and such formulations must differ from time to time and from people to people. Generalisations about Art are valid only in the same degree as the psychological generalisations on which they implicitly depend are themselves valid.

Views based upon the foregoing considerations would seem to allow ample freedom to those who distrust attempts to reduce Art to terms of rigid formulæ. It might even appear that we are confronted with too many variables to admit of bringing any semblance of order into the subject at all. But it must be remembered that although the mentality of individuals varies greatly even within a single nation, it is yet possible to make generalisations of very wide validity. Just as we can generalise with regard to diet or drugs in spite of the infinite variations of physical constitutions, so we can, within similar limits, do the same in the case of psychological activities of which Art is a special example.

And it must always be insisted that *if* we were to have complete knowledge of the psychological make-up of any individual, the precise effect of any æsthetic experience would be rigidly predicable and its value, therefore, capable of assessment.

THE NATURE AND DEVELOPMENT OF THE SENTIMENTS.[1]

By Charles S. Myers, F.R.S.

TO A. F. Shand British psychologists are indebted for the modern use in this country of the term 'sentiment.' He was the first to rescue it from its vague popular significance and to apply it to denote certain large mental systems, particularly those of love and hate, which are characterized by the organization of various lesser emotional systems within them. He freely admits[2] that his theory of the sentiments "is not chiefly concerned with the meaning to be given to the term 'Sentiment' . . . . . but essentially concerns the nature of Love and Hate (the main sentiments) and their distinction from the class of Emotions to which they had been hitherto supposed to belong." He points out[3] how the greater system of the sentiment controls and modifies the lesser systems of the emotions organized therein, how it attracts within itself all the thoughts, volitional processes, virtues, vices and emotions which can assist in the attainment of its ends, and how it affects and is affected by the whole character of the personality. That is to say, Shand is mainly occupied with the differentiation, position and function of the sentiments, without concerning himself in detail about their psychical origin, or their physiological concomitants.

In an endeavour to fill this gap, McDougall[4] has defined the sentiment as "an organised system of emotional dispositions about the idea of some object," having for its physiological basis "a system of nerve paths by means of which the disposition of the idea of the object of the sentiment is functionally connected with several emotional dispositions."[5] It will be noted that McDougall uses the term 'emotional disposition' in place of Shand's term 'emotional system.' The sentiment becomes for him an organization of emotional *dispositions, i.e.*, of "ten-

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[1] Read at the British Psychological Society's General Meeting at Cambridge, 23 July, 1921.

[2] *Foundations of Character*, 2nd Ed., 1920, p. 50 (footnote).

[3] *Ibid.* pp. 62, 106, 110, 121, etc.

[4] *Introduction to Social Psychology*, 14th Ed., 1919, p. 159.

[5] *Ibid.* p. 126.

dencies to experience certain emotions'"[1] after some previous experience of those emotions. According to McDougall, not only do the sentiments arise out of the organization of emotional dispositions or tendencies, but (as a natural consequence) the sentiments themselves are also tendencies. A sentiment, he expressly says[2] is " not a fact or a mode of experience." " What is meant by saying that a man loves or hates another is that he is liable to experience any one of a number of emotions or feelings on contemplating that other."[3] In other words McDougall regards the sentiment of love not as involving a specific *feeling*, but as a psycho-physiological *structure*, characterized by the tendency or liability to evoke, under appropriate conditions, a certain series of emotions or feelings, *e.g.*, of joy or wonder when the 'loving' mother sees her young at play, of tenderness when she nourishes or protects them, of distress when they are suffering, of fear when they are in danger, of anger when she is attacking another who would injure them, etc. So, too, McDougall would regard hate as a mere structure or organization, characterized by the liability to experience, say, anger, when one attacks one's enemy, joy when one has worsted him, fear or distress when he seems likely to be successful, etc.

According to McDougall, then (and also according to Drever[4]), a sentiment—be it of love or hate or of any of the various shades and modifications of these, *e.g.*, like, dislike, regard, affection, devotion, etc.,—does not involve the actual experience of a specific feeling, but is merely the liability to experience a certain gamut of emotional feelings which have come to be systematized about the idea of some object. This view I find it impossible to accept. I cannot admit that such a restricted use of the term 'sentiment' is, as McDougall claims it to be,[5] " in fair accordance with its usage in popular speech." In general parlance, 'love' and 'hate'—with their various shades and modifications—indicate definite feelings, and not merely tendencies to the simpler emotional and other feelings organized within the system of either sentiment. All the world over, love and hate are recognised to be distinct feelings, not the mere liability to evoke joy, anger, fear, wonder, etc.

Nor is such a view in accordance with psychological principles. We are not content to describe the percept of an orange in terms of the various sensations of colour, hardness,

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[1] *Ibid.* p. 123.
[2] *Ibid.* p. 122.
[3] *Ibid.* p. 123.
[4] *Instinct in Man*, 2nd Ed., 1921, Ch. ix.
[5] *Op. cit.* p. 122.

taste, etc., which the object may evoke. We do not regard a percept merely as a 'disposition' or liability to produce certain more elementary effects. We recognise that percepts *are* 'facts or modes of experience,' arising within a unity more complex than that of certain other simpler experiences organized therein.

The sentiments of love and hate, then, are not merely a consciousless system of emotional dispositions, but, like the emotions themselves, are characterized by very definite feelings of their own. The adoption of this view is in no way antagonistic to the recognition of the fact that, to use McDougall's words,[1] one may "be said to love or hate a man at the times when he is not present and when one is experiencing no emotion of any kind." For there are two distinct ways in which the term 'sentiment' may be used, the one involving the actual experience, the 'sentiment feeling,' of love or hate when the object of the sentiment is seen or thought of, the other being the sense in which one may, in the presence or absence of that object, be said to love or to hate him without experiencing the sentiment feeling of love or hate. So it is with feelings of quite other kinds, which have become strongly associated with any given object. Thus I may state that I desire something, that I am bashful or hopeful of doing something, or that I am envious of or sympathetic towards, or even angry with someone,—without necessarily experiencing at that moment the feelings of desire, bashfulness, hope, envy, sympathy or anger. When, therefore, I say that I love or hate an object without actually experiencing the corresponding sentiment feeling, I merely imply that I am liable to feel a love or hate of him,—in other words, that I have a 'disposition' to a sentiment feeling. This disposition is based on my past experience of love or hate in relation to that or to some similar object. Such past sentiment feelings help to clothe my idea of an object with 'value'; and it is chiefly in virtue of this establishment of values that I come to hate, to dislike, or to admire a person without at the moment experiencing those sentiment feelings.

Let us now pass on to consider the origin of the sentiments. McDougall (followed by Drever) maintains[2] that the "rudiment" of a sentiment may be "formed by the association of a single emotional disposition with the idea of some object." For example, he ascribes[3] "a rudimentary sentiment that we can only call a sentiment of fear" to a child who has learnt by his

[1] *Ibid.* p. 123.
[2] *Ibid.* p. 164.
[3] *Ibid.* p. 163.

experience of an angry father to dread him, and whose "mere idea" of his father has become associated with a disposition to experience fear. Now this seems to me to be an entirely mistaken use of the term 'sentiment.' If the disposition to an emotion which each transient emotion leaves behind it, after becoming associated with some particular object,[1] becomes or tends to become its own rudimentary sentiment, if we may thus acquire in turn the "rudimentary sentiments" of fear, anger, disgust, etc., and if, as McDougall maintains,[2] "the emotional dispositions comprised within the system of any sentiment are . . . . . not directly connected together" but are merely attached to a common idea,—how comes it that those various rudimentary sentiments can give rise to the stable full-blown sentiment feeling of hate, dislike, etc.? The position which McDougall has here assumed is doubtless determined by his conviction[3] that the sentiment "is not natively given in the inherited constitution." But surely every mental experience (for we must now admit that the sentiment originally involves a specific mental experience—the sentiment feeling) is natively given in the inherited constitution. Surely the ability to experience the sentiment feelings of love, dislike, hate, etc., under appropriate external and internal conditions is as much inherited as the ability to experience the emotional feelings of fear or anger, the sexual appetite, or indeed any other mode of consciousness which is induced under appropriate conditions.[4]

Stout,[5] Shand,[6] and McDougall[7] lay stress on the first appearance of sentiments at the *ideational* level. But it would be a psychological error to suppose that the sentiments arise as something quite new at a relatively late period of mental development, over-lying and controlling the old, much as the epicritic (discriminative) sensibility of the skin has by some been supposed suddenly to come into existence and to repress (or suppress) the more primitive protopathic (all-or-none) system. Just as elsewhere[8] I have insisted that there has always been a rudiment of the epicritic system, and that evolution has proceeded on the lines of differentiating and isolating that rudi-

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[1] I presume that it is the emotion rather than its disposition which has become associated with the object.

[2] *Ibid.* p. 126.

[3] *Ibid.* p. 159; cf. Drever, *Op. cit.* p. 207.

[4] Cf. Shand, *Op. cit.* p. 43.

[5] *Manual of Psychology*, 3rd Ed., 1913, pp. 699 ff. Stout arrives (pp. 699, 700) at so broad a definition of sentiment at the ideational level as to regard it as the consideration of any system of ideas from the conative aspect.

[6] *Op. cit.* passim.

[7] *Op. cit.* passim.

[8] *Discovery*, November, 1920. p. 340.

mentary epicritic system from the protopathic, of magnifying it and of making the now more purely protopathic system subordinate to it; so too, here I maintain that we are not to look for the beginnings of the sentiments at the ideational level. The rudimentary sentiments of love and hate are not mere *dispositions* to the feelings of joy, distress, anger, fear, etc., centred about an *idea*; they involve specific *sentiment feelings* which are based on certain feelings of 'interest,' which are related to the appetition or aversion of the individual in regard to *objects*. These sentiment feelings and feelings of interest may unquestionably be innate. For example, an animal is innately endowed with a feeling of positive interest in her young as soon as she first perceives them; her very first percept of them attracts and interests her, and prompts her to succour and to protect them. It is this feeling of interest, with its innate tendencies to evoke emotional and other feelings, which constitutes the rudiment of the sentiment feeling of love—which is fed and modified by later experience of the feelings of joy, distress, etc., the dispositions to which are (in the case of maternal love, at least) innately given at the very dawn of the sentiment. The sentiment feeling is not fundamentally changed, although it is much modified and 'brought out,' by the various emotional and other feelings which it may evoke. A mother's first fear for the safety of her young does not specifically alter the love which she has hitherto felt for it. So too we may later—'rudimentarily' it may be admitted—fall in love (or, for the matter of that, even a child may 'fall in hate') with a person, before experiencing all the emotional and other feelings which are naturally organizable within the sentiment, and lead to its full development.[1]

A special 'interest' similarly becomes attached to a specific object when a single emotion is repeatedly felt in relation to it. This again is a 'rudimentary sentiment' and within it is innately organized the tendency to certain emotions according to the changing relation of the object to the self. The quality of the sentiment feeling varies, say, from liking to regard, fondness, affection, love, devotion, admiration, or worship, according to the particular emotional or other feelings which are in course of time evoked. Each emotion colours the original interest. Consequently, on the perceptual plane, we come to realise the existence of a rudimentary sentiment, which implies the perception of an object and the awareness of an affective interest

[1] I contend likewise that on the very first occasion when an emotion arises, it is 'rudimentarily' experienced before it achieves the expression which contributes enormously to the emotional feelings.

tending to, and subsequently coloured by, certain affective experience. Of course these emotional and other feelings differ enormously in different individuals. As Shand well says,[1] "The loves of no two men are the same. The one may be suffused with joy and happiness; the other with sorrow and disappointment." But I hold that any particular sentiment is fundamentally the same, though modified profoundly, in different individuals. Otherwise how should the same name have been given to it? When certain primitive peoples give the same name to blue and black, there is some denominator, however low in value, common to both sensations. Some basic factor must, similarly, exist both in inner feeling and in outer behaviour, for the loves or hates of the timid, the bold, the selfish, the altruistic, all to be recognised as love or hate.

Thus an object with which an emotion has (or innately tends to) become associated comes to have a distinct interest of affective origin; and it is this feeling (varying according to the emotion), and not the mere association of the idea of the object with an emotion, which is the psychical basis of the rudimentary sentiment. It is therefore a misnomer to speak[2] of a rudimentary sentiment of fear, anger, wonder, etc. A rudimentary sentiment involves a specific feeling; it is not a mere psycho-physiological structure, it is not a mere disposition to any single emotional feeling, but it includes a specific feeling, more stable and more comprehensive than that of fear, anger, wonder, joy, distress, etc.

From such feelings, then, of affective interest in an object arises our liking or disliking of it. If a child repeatedly pulls the tail of a cat, the cat, as Stout rightly says,[3] "dislikes the child." But this does not *merely* mean (to use his words) that "it has a permanent tendency to feel emotions of anger whenever it sees the child in its neighbourhood."[4] The animal *has acquired a new feeling*, one of *general* dislike towards the object in relation to itself, whereas the passing emotion of anger occurs in relation to some temporary *specific* situation in the relation of the object to the self. Such a sentiment of dislike, say in a dog or elephant, may afford it delight when it sees the object of

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[1] *Mind*, 1896, vol. v., p. 226.

[2] As McDougall does (*loc. cit.*) in regard to fear. I appear to approach Stout's standpoint when he observes: "On the higher levels of mental life . . . emotional dispositions are very complex, and are called *Sentiments* or *Interests*" (*op. cit.* p. 419), were it not that I am trying to trace them to an origin in *lower* mental levels. So too, Drever (*op. cit.* p. 210) differs from me in distinguishing interests, as innate and on the perceptual level, from sentiments, as acquired and on the ideational level.

[3] *Op. cit.* p. 419.

[4] *Ibid.*

its dislike attacked by another, whereas a sentiment of affection may prompt it to aid a human being in distress.

We may rightly term the dislike of a cat for a child, or the like or dislike of any animal or young child for any object, a 'rudimentary' sentiment feeling, recognising that the complete evolution of a sentiment requires the full development of free ideas. If we could suppose that an animal can clearly represent to itself its young when it is absent from them, and the relation of itself to its young, it will have attained a fully developed sentiment. But all grades of sentiment feeling are recognisable; and it seems to me impossible to draw any clear line of separation between man's love of God or of truth, the love of a cow whose calf has just been removed and the (scarcely more than) interest of the bird that has just hatched out its young. For the essential nucleus of the sentiment is an interest in the object, *quâ* object; and its consequence, its very *raison d'être*, is to invoke a variety of simpler emotional and other feelings according to the various situations in which the subject finds itself in relation to that object. The sentiment feeling is there from the start, just as the percept exists from the start. And just as the percept does not arise from the constituent sensations, but is developed *pari passu* with them, becoming fuller as they become clearer,—so the sentiment feeling develops to maturity with the exercise of the emotions belonging to its system, but does not originate merely as a disposition derived from and tending to them. The *raison d'être* of a sentiment is to provoke one or other of a variety of useful emotions, just as the purpose of the emotion, say, fear, is, I believe, to provoke one or other of a variety of useful instinctive reactions. We can no more identify a sentiment feeling with its emotional systems than we can identify an emotional feeling with its varied forms of expression. If the instinctive reaction of flight were to follow *immediately* on a dangerous situation, if before a given situation there were possible no instinctive reactions other than flight, such as clinging to the mother, immobility, defence at bay, etc.,[1] then the emotion would not be experienced. So too the sentiment feeling, beginning, it may be, as little more than a vague interest of the individual felt for a percept and developing into affection, dislike, etc., insures a variety of emotional responses according to the situation. What is constant in the sentiment is the specific, sometimes innate, relation of the self to the object of the sentiment, the *value* (as it later comes to be recognised) of that object to the self. It is this subject-object relation, grounded

[1] Cf. Shand, *Foundations of Character*, pp. 190 ff.

on the interest felt by the self in the object, which, with the higher development of abstract ideas, plays so important a part in the development of the full-blown sentiment.

Drever seems to me wholly mistaken in calling a phobia a 'simple sentiment.'[1] It is just the absence of the feeling of sentiment which makes the phobia a complex and gives it those relatively uncontrolled—not, I think, necessarily ungraded or protopathic—characteristics which are the distinguishing marks of a complex. Hart,[2] following Freud and others, terms the complex an emotionally toned system of ideas. But if my scheme of the mode of evolution of the sentiment is correct, there seems no reason to make any distinction between the organization of ideas about an emotion and the organization of emotions about an idea. I agree, therefore, with Rivers[3] that the complex differs from the sentiment in being essentially, as he calls it, a "suppressed body of experience."

The conclusion to which we have arrived is that the sentiment is not the mere outcome of the successive experience of a number of different emotional or other feelings as they come to be organized as different affective dispositions about the idea of the object of the sentiment. It also involves an affective experience, a feeling *sui generis*, attached even in its rudimentary form to the object perceived. This specific feeling corresponds to the neurological condition which controls and evokes the different emotional and other feelings in the subject according to the varying situation of the subject-object relation. In other words, the rudiment of the sentiment is to be found not, as McDougall and Drever suppose, simply in the dispositions to fear, pugnacity, curiosity, self-subjection, self-assertion, parental instinct, repulsion (I use McDougall's terminology[4]), organized by growing experience about the idea of the object. It is not merely built up from below as a 'mental compound' of affective dispositions at the ideational level. These enter into its above-ground structure, but its foundations are to be sought in the form of the affective appeal made by the object to the subject's attention—in the kind of interest, related primitively to the impulses of appetition and aversion, to which the object gives rise. With the clearer conception of subject and object and of concrete and abstract ideas, this feeling, qualified by later affective expression, is largely responsible for the experience of

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[1] He even agrees (*Op. cit.* p. 209) with Morton Prince (*The Unconscious*, p. 152) that a sentiment is merely "an idea linked with an instinct."

[2] *Psychology of Insanity*, 1912, p. 61.

[3] *Instinct and the Unconscious*, 1920, pp. 86, 163, 233.

[4] *Op. cit.* p. 125.

values. At the same time, by its increasing and systematic control of various emotional and other feelings, it develops an ever-growing strength, stability and complexity of form and organization, and it gains fuller expression by the aid of such feelings. It may, as Shand has so well illustrated,[1] develop new feelings within its system, *e.g.*, jealousy, envy, revenge, sorrow, pride, ambition, avarice, remorse, shame; and it tends to develop special qualities of behaviour, *e.g.*, sincerity, gentleness, loyalty, forgiveness, deception or meanness; it also tends to be modified by the emotions coming within its sphere, absorbing their specific qualities within its own as a sentiment.

Those who hold that the sentiment is dependent merely on its organized emotions may be compared with those who maintain that the emotion is dependent merely on its expression,—that we are sorry because we cry, or are angry because we fight. Just as a new affective element, in addition to the organic and other sensations concerned in emotional expression, enters with the development of the emotion, so a new affective element, the rudimentary sentiment feeling, enters with the ability to 'appreciate' an object *quâ* object, *i.e.*, to like or to dislike it. It is as true to say that it is the rudimentary sentiment feeling that determines our emotions as to say that it is the emotions that determine our rudimentary sentiment feeling. The capacity to experience a sentiment is innate; the opportunity is acquired. The sentiment has been elaborated to prevent the disorderly action of the emotions, just as, I believe, the emotion prevents the disorderly appearance of instinctive activities. When, through disorganization, the sentiment feeling is no longer possible as a conscious experience, the emotions take on that independence, that disorderly and uncontrolled character which they assume in what are called 'complexes,' warring against the conscious personality of the subject. So they do when an intense but transient, emotional situation is dissociated from the personal consciousness before a fully developed sentiment has been formed.

[1] *Ibid. passim.*

MUSIC AS PURE PSYCHICS.

By Henry J. Watt, M.A., Ph.D., D.Phil.

MUSIC is commonly said to be the purest of the arts, so detached from the material suggestions of every day life as to draw upon itself the attribute of divinity. Poets and essayists, scientists and philosophers vie with one another in praise of it. It is a separate world, a fit home for the soul, a realm of pure spirit. It appeals more directly to our emotions than any other art. Nothing stands between us and the simple beauty of its parts. No fog of matter pervades its ethereal substance. The mind of the hearer is not misled by the clouds of barren facts that enwrap our world of sight and prevent us seeing the beauty of vision in purity. So even the simplest of us are caught up by the beauty of music and are thrilled with the joy of its mere existence. We learn to love the world for the music it gives us more easily than we love it for its other gifts. For we feel that the giving is more complete. Rather than a gift it seems to be the revelation of another world, the promise of many more, the earnest of the truth of being, its divinity. We feel we know by its pattern what a world purified of all dross, structured in perfect beauty would be. Then we can be sure that other worlds might well be perfect in the harmony of goodness or firm in the certainty of truth. We finally arrive at the hope that all these schemes might in some time of perfection be wrought together into an enduring whole of the essence and type of music. Our souls would yield themselves as gladly to it as they do to music, and we should pursue its promptings with a manifold eagerness. In such a world of phantasy we feel that there is no room for the detached evil and misery that stalks distressfully through our present life. Discord is there not separate and dichotomic. However unwelcome it may be when thrust upon us unguardedly, in music it is as much the fundament of beauty as the sweetest fragments of sound. In the perfected art we lose all consciousness of what in its isolation might be sweet or sour. Such beauty has no need for a background of self-centred fragments of distress. And by these signs we learn that in a divine life no part would be found without importance for the whole. Each

noticeable fragment would be equally servant to the perfection of all. There would be no lower world, no evil cast forth, no horror wandering round to urge us to greater zeal for the best. And so music is to us the pattern of the divine, the innermost type of the deepest realities.

And we may be sure that music will always have this action in the mind of man. Mathematics has always been the type of perfect knowledge, the paragon of reason. However much the rationalistic instinct to which it for long gave such power may now stand in disfavour, no age perhaps has felt the compelling sway of the ideals of mathematics more than the present. Every fresh conquest of mathematical genius renews the conviction that there is no science except in so far as there is mathematics in it. And the achievements of research into positions and quantities have passed in these recent generations into such crescendo that conviction seems utterly compelled. We do but hope that the structure of this perfect scheme of quantities and positions may be suffused with the more elusive spirits that show themselves to us in the colours, smells, and other qualities of sense, the synthetic unities of thought and reason, and the essences of our feelings and emotions. These things speak to us of other bonds and fibres in the world. And music seems to bear out this idea. We live in the world of music without a thought or sense for position and measured quantity. Music is nowhere: it is a land of itself. The tones and melodies we hear cannot be measured, however it may be with their physical basis. Music consists of pure sense and feeling, a wondrous range of "qualities" moulded by indefinable forms and linked to the soul by ineluctable bonds. Therefore music is divine, a refuge from the crudities and cruelties of this world of matter as we find it and from its unyielding steel of quantity and movement that chills the soul when we contemplate it.

All our instincts and interests urge us then to set the ways of music before our reason and observation that we may gain from it the real lessons it has in store for us.

The scientific study of music may follow three different lines. (1) It may confine itself to the analysis and description of the actual structure of music as we find it now or at any other time. The historical sequence of its development is quite another problem. For history we need a description of the sequence of changes that has brought music to its present conditions and a record or theory of the cause that led to each particular change. The tracing of these causes necessarily implies a knowledge of the general science of music sufficient to guarantee their truth.

For causes are not mere moments or accidents of time. They are for all time. Each of them still guards the structure of music as it now is, whether it maintains some element that now lies within the usage of music or whether it protects the sphere of music from its rude intrusion. No mere history can provide for the full understanding of a present living structure. For that we need a knowledge of the forces that now maintain it in life. And these can be adequately gauged only if we know clearly what the structure is that we are to explain.

And the descriptive analysis of music itself greatly reduces the range of items for which we have to find remoter cause. For, as music is made by cultured men of trained observation and memory, it must needs be that the works they create are built by them out of simpler parts whose functions within their surroundings they have learned to appreciate by observation. But mere appreciation of effects does not imply the ability to describe these effects or to arrange them in a systematic manner so that they can be easily held before the understanding. And so one of the great explanatory tasks that logically follows the work of descriptive analysis is the classification of the properties and functions of the simplest parts or elements of music. These parts are familiarly the tones, intervals, sequences, chords, keys, phrases, and forms, and all their differences and changes in different settings. This knowledge constitutes the science upon which the art rests.

(2) Behind the mind that includes all these things lies the body upon which it is dependent. And the same methods of study apply to it as to the mind. A history of the organism is not a sufficient explanation of its present functions. It merely traces the course by which the organism has attained these functions and the conditions that determined each change. What we still need is a knowledge of the conditions that now produce and maintain them. These conditions form a closed system of factors of a completely sufficient kind. For of course the past as mere past has no determining effect upon the present organism. Here we have an exact parallel to the direct study of music as experience. The mere history of music is a purely antiquarian interest except in so far as it portrays a special group of those factors describable by science of which another larger, smaller, or different group maintains the music of any other period. A complete science of music would of course be able to account for all forms of music, and at the same time for their historical sequence, just as a complete physiology will take into its range the functions of all kinds of living organisms, past as well as present.

(3) Besides the science of living mind and the living organism, there is the science of the relations between different living organisms or biology. By it we seek to explain how the structure and functions of one organism are passed on to another, how differences arise in the new generation or disappear again, and how the functions of organisms generally are related to the nature of their physical environment.

Psychology, physiology and biology therefore embrace the whole range of knowledge required for a full study of the natural basis of music. These sciences are concerned respectively (1) with the mind in which music lives, sounds, and is enjoyed at any moment whether in passive reception or in active reproduction or creation, (2) with the body that takes up the music from its physical source and passes it to the mind, and (3) with the history and evolution by which the body-mind has arrived at the powers required for the appreciation of music.

There are many to-day who object strongly to the very thought of a science of art. Art seems to them to be beyond the mere possibility of scientific elucidation. It is "a flash of the will that can," an inspiration that outruns all rules, a structure at every moment far too individual to be reducible to any general terms. Of course this is perfectly true for the instant and time of creation. Art, like life, must be far on its journey and at good speed before ever its science has roused itself to the slightest movement. Life is the basis of all knowledge, and how can there be knowledge of a thing till that thing at least as a certain type has been long in existence? But it cannot ever be so. The science of art, we will readily admit, is still in its infancy. But it will grow in time to its full stature and nobility. And just as the science of the living organism is now full of plans for the experimental moulding of life's forms and for its rapid improvement and development, so one day the science of art will be able to show the creative artist fields for his genius to explore, effects that may form the stuff of his structures and combinations that he has never dreamt of. Science is systematic exploration, and unless in his preparatory toil the artist be himself a thorough explorer, he must learn to use the systematic knowledge of the scientist. His functions as artist will never cease, of course. His mind will always be the finest touch-stone of beauty, and the loom that weaves the wonderful patterns from the material passed on to him by his generation. But he will no longer, even in his giant personalities, be able to nurse the illusion that he is above all tuition, absolutely free of education, a flower that owes nothing to the sunlight of his times. The

very slowness with which art advances into new regions should show us clearly how much each artist is dependent on his own time and how he can create only on the basis of what he has learnt from it. To be an artist you must be intelligible and valuable to your fellow-men, and that can only be by the fact that your own song has almost sprung to the lips of your fellow-men. It was struggling in their hearts for utterance, and lo! it is given to them for their ease and joy.

At the present time the science of art is feeble because it is necessarily long before knowledge of the elements of art grows to the subtlety required. Some of the hardest problems of mind and life have to be solved ere the way is cleared for sure progress. But there seems to be no reason other than the distractions of different interests, especially those of a physical and biological nature, why in time these problems should not be solved. Of all the arts, literature, probably, has received the most intense study and record. The knowledge of it is far more vigorously cultivated in our universities than that of any other art. But its basis is not only difficult to explain in general scientific terms, it is even difficult to discover and describe. Musicians know precisely what it is they put together to form melodies, chords and progressions, and they have always been able to extract from their works various general rules that express the conditions under which specific effects are produced. It is unnecessary to refer to the study of the larger forms that are the frames into which all these smaller details are filled. The study of these is comparatively easy, for they are not only large and obvious, but they are often clearly before the mind of the artist during his creative work. In the study of poetry they are usually well formulated very soon after they become typical. But what is the minute basis of beauty of poetry and prose? In what does the music of speech consist? So little is known of it that the very effort to attain its knowledge seems repugnant by its very improbability. Prof. Saintsbury is an impassioned and most erudite student of the arts of speech. But even he seems to be enraged to the point of contempt by the thought of a science of beautiful language. His vast history of criticism, as he must surely be aware, has only value in the fact that it spreads the basis upon which the more concentrated and potent force of a definite science of beauty may be raised. How can we ascribe value to the judgments of practised critics unless we suppose that their insight is keener and truer than that of the rest of us, and that common to them all is some power of light that will show up the enduring beauties of literature? No doubt this power is extremely rare and difficult to attain, simply because

no instruction for its attainment can yet be given. A teacher or a critic can only point to what he considers beautiful. He is unable to state their general character; he can only mass them so as to say: "In this author is the greatest quantity of them." Only the finest natural endowment of sensitivity, fostered by great practice, can ensure a keen sense for these beauties. But nowadays we demand more than this from those who profess any science. They must not only themselves be expert palates, they must be able rapidly to instruct and refine the taste of the student. And this can only be done by instruction in general scientific terms. Such science, however, is still to be made.

It has often been claimed that art is a by-product which nature never could have *intended* or *needed* to produce. Want of *intention* probably every biological theory would admit. But *need* has been made plausible for the purposes of sympathy between individuals. The attraction of opposite sexes to one another, where there is some delay of response or "choice" of a mate, presupposes stimuli singly and co-operatively of the strongest kind. As wooing animals frequently sing in some manner or other, it was only natural that we should see in their utterances a kind of music, whose sole function was to please, attract and fascinate until they had served their turn. Then other bonds would take their place, or the lapse of need for cohabitation would make them superfluous. Whatever validity these ideas may nowadays have, there is no doubt that their exponents saw in these vocal functions no disinterested art. Nor was there supposed to be art in the cries and croonings of the young, and still less in the calls and noises made by animals under the stress of emotional excitement, whether for social purposes or merely as threats or exclamations. All of these functions were severely practical. It has been made abundantly clear by now that the animal mind is incapable of that detachment from practical ends that is implied in the notion of art. Its scope is far too narrow for any sense of art to be possible. In fact, the whole mechanism of utterance is in them almost entirely reflex in its motor aspect, while in its sensory aspect it is either likewise reflex or it is only brought into connexion with the animal's individual "experience" by the accidents of association.

In recent biology, the attitude towards these racial differences between animals has altered so much that it seems absurd even to suggest that the needs of life could have produced new variants. A power there undoubtedly is that produces them, but it seems to be entirely withdrawn from any contact with the actual circumstances of life of the animal as an individual.

The chromosomes of the germ cell, whether they are souls are not, have certainly no windows that look out upon the circumambient universe of the soma. The view most acceptable at present looks upon variations of the somatic powers as entirely accidental as far as the circumstances of an animal are concerned. They arise: that is all we need to say: and if they happen to be useful so much the better for the creature concerned; if not, it will have the many disadvantages of a useless burden in life and it will doubtless quickly succumb. As far as active life is concerned of course, the results of this latter origin are much the same as those of the former. They both rule out art from these lowly origins. Vocal music was at first purely practical. It only survived because it was useful.

This being so, it may seem puzzling to explain why it ever appeared at all, and why, if it appeared, it survived. Surely the chances of function offered by the ears could have been moulded to better use. Why did nature so lavishly spend the resources of the organs of hearing upon the "musical" functions of the ears and so niggardly upon that highly practical function of localisation that is so prominent in our sense of vision? Vision is by far the best and most comprehensive of our senses. Why then was not hearing moulded on somewhat the same plan as vision? Simple experiments show that our power of localising sounds in space is comparatively very poor. We make the grossest errors, and we can only do the most of what we do by virtue of the fact that vision is always near at hand to support the defective identifications of the ear. And many of the acts by which we place sounds in space around us are not really localisations in any true or primary sense of the term. They are merely inferred from slight differences in the musical aspects of sounds that we learn to connect with places which are given to us otherwise, especially by vision. The power we have of distinguishing places by hearing without any outside aid and without inference is very slight indeed. But vision gives us differences of position in the greatest detail imaginable. Surely then it would have been better if nature had devoted the organ of hearing to the sense of the places of sounds as much as possible, and had left the pitches and quality-blends of sounds aside. Our world would surely have been the poorer for this, but we cannot suppose that nature had our pleasures in mind when she planned the ear. Besides—who knows?—these sound-places might have themselves built up the basis for an art of position and of form similar to those that we find in vision when differences of colour are entirely neglected.

Now it is evident that a question of this kind reduces itself

ultimately in scientific thought to the question why the organ of hearing displays the functions we actually find in it. And for the elucidation of this deep question we must follow two lines of enquiry. In the first place we may consider what range of variation is found amongst different animals in the matter of localisation of sound. Then we can see how our own powers compare with those of our fellow creatures. Does any animal possess a sense of hearing made up of a large number of organs of hearing, each one capable of giving a place to a point of sound as the sensory elements of probably all forms of compound eye do? It has been thought that the elastic fibres of the antennae of mosquitoes form a very primitive sort of ear. But the theory of their action that is most probable in no way claims that they form a field of hearing in which each fibril acts as a point and is separately capable of placing a single sound without serious detriment to the powers of its neighbours to do likewise. The dominant theory considers these rudimentary auditory functions from the point of view of their bilateral symmetry. The insect does not locate a sound by the use of a single sensitive terminal. Rather is it probable that when a sound produces a more intense effect on one side of the line of the animal's symmetry a turning process is initiated which leads to the other side being stimulated more intensely, and that rest only comes when both sides are equally stimulated. In this way the animal takes up a definite orientation to a source of sound that must in the end lead it rapidly to that object if it puts itself into motion long enough and is not diverted from the influence of the sound by more powerful forces. So a mosquito may be thought to reach a sounding body by merely mechanical processes quite similar to these that force a plant to grow upwards or to turn its leaves or its flowers to the sun. Of course the presence of a mechanism of this kind says nothing one way or another as to whether the mosquito hears the sound and its place. In fact the mechanism might well have the unpleasant effect of forcing the sound willy nilly upon the mosquito's "mind" (if it has one) whenever it occurs. The question of consciousness or more strictly of the presence of sensation in the insect has to be discussed on other grounds. All our actions probably come under the sway of the law of the conservation of energy—a purely mechanical "law." And yet we certainly are extensively conscious.

So then the mosquito has really only two ears, one on each side of its body, however many sensitive terminals it may have each side. And this seems to be true of every animal. No animal apparently exists that has more than two ears in any manner comparable to that frequently found in vision. Most

animals have only two eyes, one on each side. But animals have probably existed with three good eyes, one being on the top of the head. The rudiment of such an eye is still found in some reptiles. And many insects possess numerous single eyes—spots sensitive to light—over and above these two compound eyes. Of course symmetrical balance must be an active process in vision in so far as it is practically tolerable, which seems to be extensively the case. But it is not inevitable or exclusively necessary. In hearing there seems always to be only one ear—single or compound—on either side. And we must now enquire further why this is apparently inevitable.

An answer to this question seems to offer itself when we ask whether it would be possible for a sound to reach only one spot in a field of sensitive organs exclusively or in preponderance. This of course only repeats the previous enquiry regarding the two sides of the body, and brings us back again to the principle of symmetry. The hairs all round a leg for instance might be differently excited according as they lie in the one or other orientation to the source of sound. But pairs on opposite sides would receive equal stimulation. Thus it is clear that without some special apparatus attached to the sense-organ and helpful in the better reception of the sound-stimulus, a sound would not reach a single sensory terminal to the exclusion of the rest. And thus we come up against the question of the comparative powers of the adjuvant receptive organs of vision and hearing, namely, the lens and its adjuncts and the ossicles.

Now it is a familiar fact that Helmholtz, whose theory of the physiological process of hearing is still universally the favourite, was of the opinion that a sound reached a single (or nearly single) fibre and sensory terminal in the ear, just as the blow struck by a pianist's finger on the keyboard of a piano or, better still, the physical vibrations of a loud pure-toned whistle or pipe reach and make vibrate a single string of that instrument. The string it reaches depends upon the pitch of the sound. But this gives us a peculiar case for comparison between vision and hearing. For every colour—and colours here seem to be analogous to pitches—may reach any part of the eye's field of sensitivity, and it is by this circumstance that the eye is enabled to locate sights so finely. Thus the very feature of Helmholtz's theory that seemed so promising turns out to be against us. What we should have liked is that every sound, no matter what its pitch, should reach any part of the ear's field of sensitivity and so enable us to place sounds finely. But that it evidently does not do. So it seems that, as far as localisation of sounds is concerned, we are not much better off than the mosquito with

its organs that at first seem to us so ridiculously inadequate for the proper localisation of sounds. When we examine the facts closely we find that in this respect we cannot do much more than it can.

But if sounds of different pitch reach different points of the ear's field of sensitivity, why do not pitches seem to be the places of sounds rather than the qualities of them? This question, strange as it may seem at first, thrust itself upon several of the more notable thinkers on hearing, *e.g.*, Mach, James, and Stumpf. But the demands it made upon their reconstructive thoughts were too great to be accepted. Such a radical change of attitude towards the facts of hearing was required that they were felt to be no better than speculative suggestions, which must really be repressed by the weight of such counter-speculations as with them would give us the view of the facts of hearing that we actually have. So Mach suggests that pitches really are places, but that they are all the same, and therefore no place. A futile counter-speculation, since the demand made by the different places of the sensory nerve elements excited by different pitches just is that pitches shall be different sound-places. William James boldly declared himself ready to reject Helmholtz's theory *in toto* if the demand made by it for differences of sound-place in pitches were left unsatisfied by the facts of our experience. But in spite of these efforts to think a way through the entanglements of the physiological and psychological nature of hearing, no progress was made. And in spite of the accumulations of fine and experimental observations on all aspects of hearing and in spite of various efforts to find a new theoretical point of view without giving way to these apparently absurd demands that flow from the principle of psychophysical parallelism, no progress in the theory of hearing has been made. That is a conclusion that most experts would finally admit, however reluctantly.

The principle of psychophysical parallelism is out of favour in many circles at present. It has too materialistic a flavour for many palates. And however much the mind may be dependent on the body, we can hardly err in shunning the materialistic fog and darkness of recent generations. Besides, the principle seems to share the common vice of unreliable service, most lamentable in such a vehicle. How can it be a principle, if it refuses to carry us through the difficulties of our own problems of hearing? If it did, we should think much better of it as a principle, and we should readily waive any doubts about it that its materialistic connexions might imply. In fact, the dignity the principle would gain by really working would be quite

powerful enough to bring these connexions out of the shade altogether.

So our only course is just to adopt it; give it office and see what it will do; let pitches be sound-places and try to adjust our minds to this view of them.

And there can be no doubt that this point of view gives us a clear and coherent survey of very many of the difficulties of hearing. But we need not enter into a detailed account of them here. We can perhaps make the change of view in bulk without any detailed examination of the scene. The important point to notice is that when we admit that pitches are sound-places, we must not go so far as to compare these places with the places in space to which we ascribe colours, touches, tastes, and other sensations. This may sound rather like the counter speculations we met with in Mach,—an attempt to take back with one hand of thought what we gave with the other, and so keep our account of ideas just as it was. But it is not so. The places of colour are spatial places, whereas the places of pitches must be places without being spatial. Such places are known already. Numbers, for example, occupy places in their series, but these are not spatial places; the numbers do not lie in a row out there before or around us. Pitch-places and number-places are not, therefore, the same. For numbers are not the same sort of things as sensations at all. If the two are connected, it can only be distantly. And so we may now drop them as an illustration that has done its duty. Colour-places and pitch-places are very closely connected. And their true relation seems to be that both of them are places in the sense that a pitch is a place, but that a colour acquires a further character as a place that makes it a spatial place. The colours or points or lines that appear in a picture are of course marks on a surface and so spatial places. But when we treat the picture as a thing of beauty, we neglect this fact altogether. The colours and lines then for us are merely parts of a visual whole that is before our mind, but that could not be said to be in space at all. The distance you see in a landscape is not out on the canvas or behind it or through it. Nor is it helpful to say it is "illusory," as it psychologically is, of course. Within the æsthetic attitude it is a (space-)distance, just as the real line or distance (perpendicular to the line of sight and lying on the canvas, so to speak) of the picture is a line or distance too. Only it is not spatial because, as a mere part of natural space outside us or as merely representing such a part, it does not enter into the work of art as it stands before our mind at all. The real line or colour on the picture is only the physical means whereby a

corresponding part of the work of art as apprehended is ensured. The print on a page of poetry plays the same functions for the sounds that form the sensory basis of the poetical thing we call beautiful. We do not call the printed page either beautiful or (except by way of shorthand) poetry.

So we see that the absence of practical relation to space that prevented us seeing that pitches are places because they are not spatial places, shows us that all the spatial places that are so familiar in colours and touches and other sensations really rest upon such non-spatial places, and that in works of art the spatial colouring that these places acquire in every day life of observation is entirely dropped.

Now when this change of point of view is thoroughly carried out, we come to the conviction that the sense of hearing has all the parts and powers that the other senses have—apart from the range of colours in vision and of smells and tastes. Apart from differences of quality, that is, hearing is organised like any other sense in so far as its distinctive powers are concerned. Only, thtse powers do not apply to space, as do those of the other senses. The other senses give us not only places, but lengths, distances, forms, intervals, proportions, patterns, motions, etc. And these are the powers that the arts use and build upon. So we learn to see that hearing also gives us lengths in the volumes of tones. Low tones are long lengths—not lengths in space of course, but nevertheless lengths. You may be inclined to think this is all pure imagination, because you want to span your hand and measure the length of the tone. You can span the measure of the piano or violin string, if you like, just as you can span the length of the book that you see is red. Piano string, or book and hand are things that can be juxtaposed in this way. But you cannot juxtapose your hand and the tone you hear any more than you can really span your hand over the surface that you see is coloured. You can only span the hand you see over the surface you see; but not over the tone you hear any more than over the thought you think or the emotion you feel or over your hunger or your pain.

So, too, what we call interval in sound is the equivalent of proportion between lines or distances in vision; in short, it is the most elementary form of "figure" in hearing. And when an interval rises higher in pitch, its proportions remain constant, though the tones that compose it grow smaller in volume, just as a visual figure grows smaller at increasingly far distances.

And when we pass from tone to tone, *i.e.*, from pitch to pitch, which is really from sound-place to sound-place, we can have the same kind of connexion between them that the parallel change

in vision would give, namely, emotion. This sound-motion is the primary element in melody. And so on. We can draw out the parellels extensively in a very satisfactory way. But it would take too long to do it now.[1]

Hearing thus possesses all the typical powers of even such a powerful sense as vision (except, of course, its third dimension), but these powers are hidden away from all practical contact with the space of our natural environment. Hearing has developed these powers because the organism could not make the sounds of nature act differently upon different parts of the body without some special receiving mechanism. Each sound could produce differences of effect only in bulk in the different halves of the body's symmetry. But that little was a precious effect to be carefully nurtured into use for localising sounds in space around us. This nurture has given us an ear on each side of the head. The special receiving mechanism could not be made to throw any one sound upon different nerve terminals on one side of the body according to the position of the source of sound in space around us, as was possible with the receiving mechanism (the lens) of the eye. It could only throw one sound at one fixed place. But because the sounds of nature are themselves functional periods or waves spread out in space, each sound within the ear becomes a wave or length of excitation spread out in a line of its own that in no way affects the function that was established in the two-ness of the ears. This now appears automatically in the fact that the musical or pitch functions of sounds are all procured by differences of action along the long aspect of the system of neural terminals in the ear, *i.e.*, along the length of the cochlea, whereas the spatial functions of sounds are based upon the two ears and primarily upon the very short aspect of the neural terminals, *i.e.*, at any cross section of the cochlear tube. So nature has made the fullest use of the material and differences at her disposal. And out of it have come not only the sounds of nature, but the world of music, so fascinating and so divine, because so divorced from the common places and forms of space. Music reveals to us another world of forms and motions, one that physically runs through the spatial world in a peculiar though very real way.

But, one may be inclined to urge, the sounds of the natural world are not musical at all. They are dull, rough, noisy and uninteresting. How can all the beauties of music have issued from such a basis? Surely music is the invention of man and

[1] Cf. The Psychology of Sound, Cambridge, 1917, and The Foundations of Music, Cambridge, 1919.

the product of all his instruments. Quite true indeed, but without the ear for the noises of nature, man's instruments would have been useless. The instrument beyond all other instruments is nature's wonderful ear. And merely by enabling us to hear her noises, she has provided us with the means for music. To catch a rough and irregular process perfectly, no rough and irregular instrument will suffice. It must be as fine and delicate and pliant as is possible, the more so because an irregular process requires a very pliant instrument to follow it and take it up. An instrument fit for this work will find it perfectly safe and easy to record forces that vary smoothly, lightly and regularly. We need only invent the instruments for producing these smooth forces. And these are the musical instruments and the artists who play them. Nature's rough school has trained our organs to a fine capacity, and our minds to the subtle powers that between them enable us to create all the perfections of art and to enjoy them.

So music is not the child of nature as the older evolutionary theorists were inclined to think. Music does not really begin in natural life. The first traces of it in nature are surely only accidents. Music is rather the grandchild of nature sprung from two of its children, the forceful and imaginative mind of man and the delicate receptive sense of hearing. The marriage of these two has filled a new home with radiant faces, that nevertheless bear in themselves the features of their grandparents, freed of the marks of daily toil and drudgery and grown for the attainment of all the excellence inherent in them. But not only music, all arts share in the benefits of nature's toil for their provision. All art is a new life, a world in which mind and sense combine to bring themselves into fullest realisation of all their powers. It is a world of pure psychics, one might say, the child and offspring of the world of pure physics. It is all as divine as music so clearly seems to be. It all, in a sense, stands clear of nature, even when it is nature herself that fills it out and appears beautiful. In art we play with the powers and instruments nature has procured for us, and in this play we learn that the divinity of music belongs equally to all art, and that it is the gift of nature herself.

THE ANALOGY OF SOUND AND COLOUR.

By C. K. Ogden, M.A., and James Wood, M.A.

THE analogy of sound and colour has been chiefly contested on the ground that their physical bases are not identical. This, however, is irrelevant for the present enquiry, since the analogy here considered may be established by methods which do not require a similarity in the physical basis—much less in the mode of physiological perception. But it should be added that though the physical basis of sound is assumed to be experimentally established, that of colour still has to be demonstrated; while in both cases our knowledge of their mode of perception, and the exact relation between subjective reaction and objective stimulus, is as yet largely a matter of conjecture.

It is therefore all the more remarkable that so many writers have summarily rejected the analogy on the strength of the statements of others, without testing for themselves the relevance of these statements. Partly, no doubt, the rejection has been due to difficulties in terminology, especially where the qualitative and emotional value of sounds and colours is concerned; and a few words on certain deviations from the current classification, which are implied by the Tudor-Hart system here described, are desirable. In particular it will assist the musical reader if we make clear in what way the view of pitch, timbre, and tone here adopted differs from that accepted by many musicians. Let us distinguish the qualities of sounds numerically in order as far as possible to avoid misconception. Those under discussion are:—

(i.) The quality in respect of which notes at the interval of an octave sound the same and notes at smaller intervals different, when sounded not simultaneously nor individually, but at an interval of time such that the first is clear in the memory when the second is sounded.

(ii.) The quality in respect of which sounds of notes at the interval of an octave differ.

(iii.) The quality in respect of which the same note played on different instruments (or on the same instrument in different ways, if it is possible, as on the violin) differ.

(iv.) The quality in respect of which notes at a smaller interval than an octave sound different, when sounded so far apart in time that the memory of the actual sound of the first is quite indistinct when the second is sounded; just as red can be distinguished as red without comparing it with any other colour.

In musical literature (i.) and (ii.) are usually taken together as a single property and called "pitch," and the quality (iii.) is called "timbre"; but in what follows (ii.) alone is called "pitch," while (i.) and (iii.), are taken together and called "tone."

The quality (iv.) is by many people not consciously recognized, but they are disposed to admit that it may be the basis of a sense of "absolute pitch." We can only note here that others are conscious of the difference, which is accentuated by recourse to different instruments. Thus, *e.g.*, the cornet, flute, and French horn are found best to give the sensation of Red, Orange and Yellow, the violins Yellow-Green or Green, the oboe Blue and Blue-Green, and the contra-bass Purple.

The divergence of opinion as to the importance of (iii.) may be illustrated by the following passage from Delacroix' Journal:—[1]

> "Chopin inveighed loudly against the school which "derives part of the charm of music from sonority. He "spoke as a pianist. Voltaire defined the beautiful as what "would charm the mind and the senses. A musical motif "can appeal to the imagination on an instrument which "affects the senses in only one way, but the union of "different instruments with different sonorities will give "more force to the sensation. Otherwise why should one "use sometimes a flute and sometimes a trumpet? The "first will be associated with a rendezvous of two lovers,

[1] Vol. III., p. 273. "Mon cher petit Chopin s'élevait beaucoup contre l'école qui fait dériver une partie du charme de la musique de la sonorité. Il parlait en pianiste. Voltaire définit le beau ce qui doit charmer l'esprit et le sens. Un motif musical peut parler à l'imagination sur un instrument qui n'a qu'une manière de plaire aux sens, mais la réunion de divers instruments ayant une sonorité différente donnera plus de force a la sensation. A quoit servirait d'employer tantôt la flûte tantôt la trompette? La premiere s'associera à une rendez-vous de deux amants, la seconde au triomphe d'un guerrier; ainsi de suite. Dans le piano même, pourquoi employer tour à les sons étouffés ou les sons éclatants si ce n'est pour renforcer l'idée exprimé? Il faut blâmer la sonorité mise à la place de l'idée et encore faut-il avouer qu'il y a dans certaines sonorités independamment de l'expression même un plaisir pour les sens. Il en est de même pour la peinture: un simple trait exprime moins et plâit moins qu'un dessin qui rend les ombres et les lumières. Ce dernier exprimera moins qu'un tableau. Je suppose toujours le tableau amené au degre d'harmonie au le dessin et la couleur se réunissant dans un effet unique. Il faut se rappeler ce peintre ancien qui, ayant exposé une peinture représentant un guerrier, faisant entendre en même temps derrière une tapisserie la fanfare d'une trompette."

"the second with a warrior's triumph, and so on. Even "on the piano, why employ in turn muffled and clear "(*éclatants*), sounds, if not to enforce the idea expressed? "We must object to sonority if substituted for idea, and we "must also at the same time admit that there is in certain "sonorities, independent of the expression itself, a pleasure "for the senses. It is the same in painting: a simple line "expresses less and pleases less than a design which gives "the shadows and the lights, though the latter will express "less than a picture. I suppose always the picture brought "to that degree of harmony in which design and colour "unite in a unique effect. We may recall the story of the "ancient painter who, when showing a picture of a soldier, "had a trumpet blown at the same time behind a curtain."

Three years later[1] Delacroix elaborated his view of the emotional qualities of different instruments as distinguished from their differences of range or texture.

"A musical motif can appeal to the imagination on an "instrument limited to its own special sounds, as, for "example, the piano, which has consequently only one "manner of affecting the senses, but it cannot be denied that "the union of different instruments, each with a different "sonority, gives more force and more charm to the sensa- "tion. Otherwise why use sometimes a flute and sometimes "a trumpet, the one to announce a warrior, the other to "dispose the mind to tender and idyllic emotions. . . . "Moreover, we must admit that there is in certain "sonorities, independent of the expression for the soul, a "pleasure for the senses. I recall that the voice of ———, "a cold singer without much expression, had by the mere "emission of the sounds an unbelievable charm."

The case of assigning definite emotional characters to different keys—though even this, strange to say, is denied by many—finds more adherents, and is indeed sufficiently obvious. In the Sonata Pathètique of Beethoven if for violin and piano

[1] *Ibid.* p. 395. "Un motif musical peut parler à l'imagination sur un instrument borné à ses sons propres comme le piano par example, et qui n'a par conséquent qu'une manière d'émouvoir les sens; mais on ne peut nier cependant que la réunion de divers instruments ayant chaqun une sonorité differente ne donne plus de force et plus de charme à la sensation. A quoi servirait d'employer tantôt la flûte, tantôt la trompette, l'une pour annoncer un guerrier, l'autre pour disposer l'âme à des emotions tendres et bocagères? . . . Encore faut il avouer qu'il y a dans certaines sonorités indepandamment de l'expression pour l'âme, un plaisir pour le sens. Je me rappelle que la voix de —— chanteur froid et sans beaucoup d'expression, avait par la seule émission du son une charme incroyable."

By inadvertence, or by a misprint, his back reference is to notes made in 1855, which his editors remark have not been found: but the passage quoted above is clearly intended.

were substituted a 'cello and piano, half its beauty would be lost, if it were transposed even half a tone.

A few of the more obvious parallels between sound and colour may now be given:—

Sound.	Colour.
Noise may be defined as toneless sound, which in all its manifestations from low to high pitch, shows an absence of any defined musical note.	*White light* may be defined as hueless (colourless) light, which in all its manifestations from darkness to full luminosity, shows an absence of any defined spectrum colour.
Sound at the extreme limits of its perception, at high and low pitch, merges into noise.	*Colour* at its limits of perception, darkness and full luminosity, merges into the colourless.
Sound, in middle pitch is most varied, and difference of tone more pronounced and easily recognised. Discrimination at its maximum.	*Colour, in middle luminosity*, is most varied, and difference of hue more pronounced and easily recognised. Discrimination at its maximum.
We may describe sounds in terms of three variables:	We may describe colours in terms of three variables:
Pitch, or high and low degrees in serial order.	*Luminosity*, or degrees of light and darkness in serial order.
Tone designating quality of sounds (qualitative characteristic).	*Hue* designating quality of colours (qualitative characteristic).
Intensity designating strength or weakness of sounds (quantitative characteristic).	*Saturation* designating strength of colours (quantitative characteristic).
A tone of high pitch gives a thin, shallow, piercing and flat sensation.	*A hue of high luminosity* gives a shallow, hard, flat sensation.
A low pitched tone appears rich, massive, and deep.	*A low luminosity hue* appears rich, massive, and deep.
A flat, A, B flat, B, in low pitch, convey the emotion of melancholy and sadness, especially in string instruments and lower register of the organ.	*Blues and violets*, especially in low luminosity, convey the emotion of melancholy and sadness.
D sharp, E, and F, in a medium high pitch convey an emotion of brightness and cheerfulness especially in the brass instruments of the orchestra.	*Yellow-Orange, Yellow, and Yellow-Green*, in a medium high luminosity convey an emotion of brightness and cheerfulness.
A low and high octave of the same tone when sounded together, are more difficult to locate than octaves of the same sound lying near each other in the middle pitch.	*A high and low luminosity of the same hue* are more difficult to locate than tones of the same colour lying near each other in the middle pitch.

A chromatic scale gives an a rhythmic progression.

A sudden change of key, without mutation, in the execution of a musical theme is disconcerting and strange.

The sensation of a series of notes rising in pitch with increasing intensity appears like a telescoping of the tones; the notes seem to diminish in interval.

The interval between the fifth and the lower tonic seems greater than that between the third and the upper tonic, in a single octave.

If sounds be reduced in intensity until they are only just audible, their tone-quality can no longer be distinguished, although their difference of pitch is still perceptible.

High sounds as they descend in pitch become more sonorous.

Certain tones have greater emotional effect in low pitch than in high, and *vice-versa*.

A luminous series of hues in spectrum order gives an a rhythmic progression.

A sudden change of colour scheme without mutation, in the execution of a decorative or pictorial design, is disconcerting and strange.

The sensation of a series of colours rising in luminosity with increasing saturation appears like a telescoping of the hues; the colours seem to diminish in interval.

The interval between a dominant colour and its lower tonic seems greater than that between a mediant colour and its upper tonic, in a single octave, if the luminosities are kept correct.

If colours are dissaturated with neutral tint until they are only just visible, their hue can no longer be distinguished, although their differences of luminosity remains apparent.

Light colours as they descend in luminosity gain in richness.

Certain hues have greater emotional effect in low luminosity than in high, and *vice-versa*.

It should be noted that Tone, Pitch, and Intensity (fulness) and their equivalents are only *independent* variables at the middle of the scale; for in extreme cases

Variation in *Pitch* alters the *Tone*.

Variation in *Fulness* alters the *Tone*.

Variation in *Luminosity* alters the *Hue*.

Variation in *Saturation* alters the *Hue*.

There are many features of the Analogy which cannot be treated in this summary manner, and certain problems such as those of texture and hardness, as commonly understood, involve a more detailed examination of accepted views. What is known to artists as *texture*[1] has very little to do with colour as such, and is rather a question of the kind of form which receives the colour and the kind of light which reveals it to the eye.

[1] A *sense* of texture as shewn in a painting is found where the artist has suggested textural qualities of the objects he has represented (the picture may have a textural quality of its own at the same time); this is often called "quality of paint" or in sculpture "patine."

The form may be a surface rough or smooth, soft or polished, still or moving, opaque, transparent or absorbent, and the light may be direct, refracted or reflected. When the local colour of any object reflects into itself, the light is *refracted*; this is the case with sateens, velvets, etc. The dissaturated light shining from a surface is scattered daylight, partly tinted with local colour and is *reflected*. Opacity shows reflection, transparency shows refraction, and saturation shows absorption (*e.g.*, transparent brown absorbs a lot, refracts a little and reflects very little).

In reflected light Red becomes bluer in the lighter tones and yellow in the darker. Yellow and Blue become greener in the lighter tones and redder in the darker. If the light is refracted from these colours an opposite effect will be observed.

All of this is of the greatest value in questions of glazing, laying in colour grounds, mixing colours with white, etc., but is not a quality of the colour itself. Thus the difference between red Velvet and red Linen is not one of colour. The colour on the linen could be made similar, by saturating and lowering in pitch the red of the velvet. Where there is a surface refraction (high luminosity), much reflection and little absorption, the colour appears varied in hue; and though the *total* colour effect is definitely judged to be the same as that of the non-refracting surface, the *parts* appear different in hue and give the whole its characteristic difference. For example, in the case of dyed wool and satin the similarity will be increased if the satin be crinkled, and in some cases the difficulty of distinguishing two materials by the form and the action of light due to that form, will be considerable.

The musical equivalent for this textural difference is of course to be found in the different instruments by which a note is sounded. There are the same characteristics of roughness, smoothness, woodenness, brassiness, etc., of sounds that are muffled and sounds that are clear. A flute is reflective, a piano absorbent, a violin or bugle transparent. These characteristics of instruments are different from the qualities which ally them to certain notes or colours, and though important are not primary questions of sound.

No works of art or music of the first class can exist without an exploitation of textural qualities, and though these qualities, when so exploited may seem equal in importance to the emotional characteristics of the colours or forms of the medium, their appeal is in reality a secondary matter.

It is perhaps worth while to point out here a fact that is of considerable importance for the discussion of such systems as

those of Ostwald, namely, that what is known as the "normal" eye of science is not adequate to deal with these qualitative distinctions. "Le premier mérite d'un tableau," as Delacroix puts it, "est d'être un fête pour l'oeil. Ce n'est pas a dire qu'il n'y faut pas de la raison: c'est comme les beaux vers, . . . toute la raison du monde ne les empêche pas d'être mauvais, s'ils choquent l'oreille. On dit: *avoir l'oreille*; tous les yeux ne sont pas propres à goûter les delicatesses de la peinture. Beaucoup ont l'oeil faux ou inerte; ils voient litteralement les objets, mais l'exquis, non."[1]

THE ANALOGUE OF PITCH.

One main current of opposition to the analogy as above outlined comes from a demand that Hue (whose psychical equivalent is Tone) shall be equated with Pitch (its *physical* equivalent on the wave theory). From this it is argued that there is only *one* octave in colour; or, on the other hand, a complicated system of hypotheses is devised to render the breakdown of the physical parallelism less disconcerting.

Physically, of course, the octaves of sound rise in pitch from base to treble, in a geometrical progression by a power of two, *i.e.*, each octave has double the number of vibrations of the preceding one. With this rise in pitch, a note and its successive octaves appear to the senses as equal intervals. The vibrations of these intervals increase in a geometrical progression. Similarly as light increases from darkness, the "notes" and their luminosity octaves appear to the senses as equal intervals; and though these intervals are constructed by increments of luminosity in a geometrical progression, it is on the psychological equivalence for sensation of the two series that the analogy is here based.

THE ANALOGUE OF TIMBRE.

If the orchestration of musical sounds be considered in regard to timbre, which, it must be remembered, is to sound what hue is to colour, it will be found that the full qualitative value of a note can only be obtained in one definite pitch, different for each note.[2]

It is this difference of quality in different notes of the same pitch that determines the different classes of human voices—bass,

[1] Delacroix *Journal*, Vol. III., p. 438.

[2] The term note is here used in the sense of an individual sound, of which its octaves are its manifestations in higher pitches. Similarly we have occasionally used the term "note" in light as referring to an individual colour at a given degree of luminosity.

baritone, tenor, contralto, alto, soprano; and it also determines the functions of the various intruments such as double-bass, 'cello, viola, violin, etc. A single instrument taken up the scale passes through all the tones, but these are tinged with the characteristic tone of the instrument. We may express the analogy thus:—

A colour of definite hue can only reach its full saturation at a definite degree of luminosity. No two hues have their full saturation at the same degree of luminosity.

Similarly a note of definite quality can only reach fullness or purity at a definite pitch; no two notes can develop their full purity at the same pitch.

It will, perhaps, make matters clearer if we repeat our table of terms.

A. Pitch.	a. Luminosity.
B. Timbre or Tone.	b. Hue or Colour.
C. Intensity.	c. Saturation or Purity.

These are psychological equivalents, and the reader must not read into them physical meaning from the association of the terms with wave-theory equivalents. It is because this has been done in the past that the analogy between (B) and (b)—which is meaningless on the wave-theory—has been overlooked; in addition it has caused much confusion between (a) and (c). Luminosity (a), is photometric intensity. Saturation (c), is quite a different thing, as psychologists have long recognised. The saturation of a red is "redness of a red in the black-red-pink-white series." If the saturation series, for a particular luminosity, is thought of as a horizontal band, we can imagine another series of such bands, each one for a particular luminosity, arranged parallel to the first. In other words, the luminosity series may be imagined to run in a vertical direction, the saturation series being horizontal. If such a chart were constructed for different hues it would seem that each hue had its maximum saturation at some particular level, the level (luminosity) for maximum saturation being different for different hues. The actual construction of such charts is, however, complicated by the fact that change in luminosity causes change of hue—and this, as we have urged, to a much greater extent than had previously been imagined. Hence the unsatisfactoriness of many of the coloured-pyramid methods of representing the effect of the three, supposedly independent, variables (a), (b), and (c).

The very fact of psychologists using these particular three variables suggest that they realise the inadequacy in their domain of the purely physical variables amplitude, wave-length, and wave-form. Otherwise their representations would be in terms

of the variables photometric intensity, hue (for this corresponds to wave-length on the physical theory), and whatever is the (to them) unknown equivalent of wave-form. Psychologists cling, in the domain of sound, to the three variables, pitch, timbre, and loudness chiefly because the analogy between sounds and waves—the three corresponding variables of the latter being wave-lengths, wave-form, and amplitude. The success of the wave-analogy in sound in the hands of Helmholtz sufficiently explains this. But if one considers the sense-data of sound without any preconception as to what ought to be the case on the wave-theory, one can see at once that loudness, or physical intensity, does not play the rôle it is supposed. The psychological equivalent of loudness in colour is usually the result of increase in the area covered, but loudness is an assault made upon the ear, and, as in music, this effect is not produced by one method only. The feeling of aggression, of domination, of advance and retreat, which is characteristic of the sensation of loudness, may be produced in music in various ways, besides increase in volume; as by causing an abrupt sound to break in upon a soft and sustained one, or conversely by playing stringed instruments very loudly in an orchestra and suddenly introducing a high but not very loud sound, or a triangle or oboe.

In colour, therefore, the equivalent of loudness may be variously felt in saturation, in increase of area, in the contrast of a delicate and clear colour against rather harsher colours, or in the position occupied by a colour in regard to spacing and its combination into forms.

"There is so strict an analogy between shade and sound," says Hogarth, "that they may serve to illustrate each others qualities: for as sounds gradually decreasing and increasing give the idea of progression from, or to, the ear, just so do retiring shades show progression, by figuring it to the eye. Thus, as by objects growing still fainter, we judge of distances in prospects, so by the decreasing noise of thunder, we form the idea of its moving further from us."

Hogarth goes on to explain that the "retiring" shade is so called, "because by the successive, or continual change in its appearance, it is equally instrumental with converging lines, in showing how much objects, or any parts of them, retire or recede from the eye; without which, a floor, or horizontal-plane, would often seem to stand upright like a wall. But although the retiring shade hath this property, when seen with converging lines, yet if it describes no particular form, it can only appear as a flat pencilled shade; but being enclosed within some known boundary or outline, such as one signifying a wall, a road, a

globe, or any other form in perspective where the parts retire, it will then show its retiring quality."

The intensity-variable which would much more readily serve the purpose of description in psychology is something akin to purity or saturation in colour. For a note of one particular timbre attains its maximum æsthetic effect of fulness (not loudness) at some definite pitch, as is recognised instinctively by composers. A further illustration of the inadequacy of purely physical concepts founded on the analogy with wave motion, to describe the perceptual domain of sound is provided by the variation which the timbre of a note may undergo without any corresponding change of wave-form, its analogue on the wave-theory. When a gramophone is played he form of the waves produced remains the same whatever the rate at which the instrument is run. For that form is determined by the movement of a needle over a surface of definite shape. Yet the speeding up of the gramophone, with its consequence increase in pitch, causes immediate change of timbre or quality in the notes produced. This effect is difficult to explain on the wave-theory. But if we take timbre as analogous to hue, and pitch to luminosity, it becomes merely the sound analogue of the variation of hue with luminosity. In other words, it is the Purkinje effect in sound.

Once the variables have been chosen it is possible to construct a colour keyboard—but one which will not have the narrowing effect of the pianoforte-keyboard in sound (with its confinement to one timbre, roughly). For our keyboard will be complete; it will embody all three variables. The analogue in sound to this would be a mighty orchestral instrument showing the complete gamut for each separate timbre.

THE ANALOGY OF THE KEYBOARD.

When thus completed, the colour keyboard resembles a series of rainbows from dark to light. Its practical advantages cannot be described in detail here, but it may be mentioned that in addition to standardising colours, it enables them to be harmonised, so that if treated with a certain amount of latitude, such as slight variations in the interval not exceeding a quarter-tone in either direction from the standard hue, it gives full scope for realising even the most delicate modifications which may be required. Sombre and much alike in the lower octaves, it gradually becomes more and more differentiated. The intervals between hues are seen to widen, and the brilliancy of the colour to increase as it reaches middle luminosity, and thence as it continues to rise, it fades off into a monotonous whiteness. Eleven

octaves are seen of which only seven or eight are distinct. Similarly in sound, eleven octaves are heard of which seven or eight are distinct.

A chromatic scale of musical sounds, of twelve musical half-tones to the octaves, extending from A to a vii. is perceived as a combination of tone and pitch, tone succeeding tone at regular intervals. Deep and undifferentiated in lower pitch, it becomes more and more differentiated, both in tone and pitch, as it reaches the middle pitch; thence, as it continues to rise, it fades off into a monotonous similarity.

In reply to the objection that this arrangement is arbitrary, we would by no means assert that it has reached its final development. Indeed, the advisability of keeping the wide interval of luminosity between the various hues given by the spectrum is at least doubtful. But the Tudor-Hart method does certainly achieve the standardisation of hue, giving the correct colour and saturation in different degrees of luminosity and producing the same colourless grey by pairs of complementaries in all degrees of luminosity. Such a standardisation of intervals forms a basis on which to gauge harmonious relationship.

AN ANALOGY OF THE INTERVALS.

Before proceeding to the question of intervals it is necessary to emphasise the fact that the psychological equivalent of the simultaneous perception of two or more sounds, is the simultaneous perception of two or more juxtaposed colours. Consequently the analogue of harmony in sound must be sought in juxtaposed colours. Melody in colour will therefore result from the espacement of colours, their isolation by intervening neutral tint, and also from the order in which colours lie on the field of vision. Juxtaposition thus may serve a double purpose, as in music sounds in rapid succession blend together and produce effects which partake of the nature of both harmony and melody.

Let us now apply to the chromatic scale described above some of the laws of harmony in sound and see if they are applicable; taking a note and its harmonics, and using the following analogical equivalents:—

Duration of note—Area[1] of colour.
Interval of pitch—Interval of luminosity.
Order of note—Order of hue.

[1] It must be remembered that we are here dealing with psychological effects—the physical equivalent would be the duration of the coloured light.

Assuming C to be the equivalent in sound of Ruby-Red in colour (the octaves being counted from it upwards) we shall have:—

Tonic Red—Dark wine coloured red.
2nd Harmonic—Red, Octave (deep ruby).
3rd Harmonic—Blue-green (deep peacock green).
4th Harmonic—Red, 2nd Octave (rich ruby).
5th Harmonic—Yellow (young leaf green).
6th Harmonic—Blue-green (lighter peacock green).
7th Harmonic—Red-violet (heliotrope, middle tone).
8th Harmonic—Red, 3rd Octave (deep ruby pink).
9th Harmonic—Orange (light orange vermillion).
10th Harmonic—Yellow (young pale yellow leaf green).
11th Harmonic—Yellow-green (bright apple green).
12th Harmonic—Blue-green (turquoise blue-green).
13th Harmonic—Blue-violet (light ultramarine blue).
14th Harmonic—Red-violet (light heliotrope).
15th Harmonic—Red-red-violet (lilac).
16th Harmonic—Red 4th Oct. (ruby pink).

It will be found that the intervals between the colours are pleasant to the eye in exactly the same degree as the sounds are to the ear, and that each harmonic is in consonance with its fundamental colour, just as in sound each harmonic is in consonance with its tone (or generating sound).

Furthermore, the colours lying between the third and fourth octaves are consonant or dissonant in exactly the same degree as the corresponding intervals of sound; their corresponding intervals have like qualities in lower or higher octaves. The octave gives unison, a perfect consonance. The fifth and fourth are consonant to a lesser degree; the major and minor third are slightly less consonant; as are also the major and minor sixth. The tritone, though not unpleasant, is not harmonious.[1] The major and minor second and seventh dissonant to a lesser degree.

Even more remarkable is the similarity of the emotional effects of the different intervals in sound and colour. The fifth in both cases is stimulating; it gives a sense of tension, of elation and of activity. The fourth is similar, but disquieting. The major sixth is passive, gentle and conclusive, melancholy; it is as though the notes were merging into one another from a distance. The minor sixth is similar, but uncertain and disquieting. The major third is calm, restful, satisfying, while the minor third is more blended but gives an effect of anxiety. The

[1] The tritone presents features which seem to require separate and more detailed treatment.

major and minor seventh are excruciating and characterless, and the same applies to the major and minor second.

If the fifth of the original scale be taken as a fundamental "note" for a new scale and developed in the same way, it will have the same qualities of harmony as the original scale possessed and by progressive fifths one can constitute a diatonic scale of every one of the twelve hues. Each scale possesses an individual quality that differentiates it from the others, which is also the outstanding feature of musical tonality.

This colour arrangement allows for modulation from one tonic to another, without disparity or unpleasantness to the eye; but perhaps the most convincing support to the analogy is provided by the fact that pictures and decorative rhythm developed in one definite colour tonic possess a particular emotional quality which is lost or changed if transposed into another key, though the harmoniousness of hues remains—just as musical themes and melodies of a definite emotional character in one key change their character when transposed into another, though the harmony remains.

The examination of a large number of nature's colour schemes which are most pleasing to the eye—flowers, the wings of butterflies, the plumage of birds, the coats of beasts, and various minerals—reveals in them harmonics correct both in luminosity and in hue. Furthermore, the principles of harmony implied by the analogy are those which were intuitively used in the most successful colour schemes of ancient art, both oriental and occidental.

THE CAUSES AND TREATMENT OF JUVENILE DELINQUENCY.

By Cyril Burt.

THE occurrence of crime in children and young persons has many reasons which induce the modern psychologist to prefer it, as material for his enquiry, to the study of the aberrations of the criminal adult. In the first place, during earlier years, the originating factors are more easily accessible; and, in the second, when treatment is undertaken at a youthful age, there is a brighter prospect of achieving a cure. In what follows, therefore, I shall principally confine myself to delinquency in the young. My conclusions are based for the most part upon an experience of juvenile offenders, who have been referred to me for psychological examination, either by the magistrate, or by secretaries of colonies for juvenile delinquents, or by the London County Council, operating through its school teachers, or through its organizers of Children's Care. In almost every instance I have kept full records of the physical, psychological, and environmental conditions of the case; and have frequently been able to follow up the child's progress for a period of seven or eight years.

In studying crime, as in most other fields of individual psychology, we encounter at the outset the fact of multiple determination. So violent a reaction, as may easily be conceived, is commonly the resultant of a plurality of causes. It needs a good many coats of pitch to paint a thing thoroughly black. Crime, therefore, in any given person proves nearly always attributable, not to some single all-explaining cause—called "moral imbecility," "inborn criminality," or (more simply and plainly) "original sin"—but to a converging multitude of alternative factors; and the nature of these factors, and of their various combinations, may differ widely in different individuals.

Usually, it is true, some one predominating factor can be singled out as chiefly responsible: here dulness of intellect, there instability of temperament, and, in another, vicious companions or a criminal home. Hence, for convenience of exposition, it seems legitimate to classify both cases and causes under half-a-dozen broad recurring types. But, in treatment, it is never safe to deal with one factor only, however crucial that factor may appear. Every probable influence must be considered: every hostile agency must, if possible, be removed.

In taking case-histories of young delinquents, I pursue the

same general plan of enquiry, the same "psychographic scheme," that I have adopted for investigating backwardness and deficiency.[1] Indeed, in all problems of individual psychology, whether the mind in question be normal or abnormal, and whether the abnormality be moral or intellectual, it is essential, for any scientific appreciation of the disturbance, to make first a complete and comprehensive survey of the whole child and his surroundings. Without this basis, no diagnosis can be sound, no treatment satisfactory. Any "psychographic scheme," therefore, must be all-inclusive: it will contain systematic headings for the analysis of the characteristics of the environment, as well as of the personality, and for the analysis of the physical characteristics of that personality, as well as of its mental characteristics, whether intellectual, emotional, inborn, or acquired. Here, for the most part, I shall follow the programme of study so suggested: but the limits of space will restrict me to psychological characteristics almost exclusively.

Of these, intelligence is by far the most easy to assess and measure. My account, therefore, of the causes that instigate crime will begin with an examination of the intellectual conditions, and proceed later to a discussion of the emotional conditions—those motives that originate in temperament and character. Physical factors and environmental factors I can glance at only by the way.

I.—INTELLECTUAL CONDITIONS.

It is impossible to evaluate the sources of crime, or to recommend an appropriate treatment, until the criminal's intelligence has first been accurately gauged. For this purpose standardised tests are now, of course, available, and should always be applied.

In considering the intelligence of the delinquent, the chief questions to be determined are these: is he above or below the average level for his age; and, if below the average, is his backwardness general or limited, inborn or acquired, relatively slight or so extreme to be diagnosed as mental deficiency? Our review may begin with the last and most serious alternative.

1. Mental Deficiency.

Of all the psychological causes of crime the commonest and the most important is now generally alleged to be mental defect.[2] With this opinion, or with the

[1] For a brief account see *Studies in Mental Inefficiency*, Vol. I., No. 3, p. 54.

[2] The most eminent authorities, applying the most modern devices of science, have been led to express this view. In England, for example, Dr. Goring concludes that "the one vital mental constitutional factor in the etiology of crime is defective intelligence" (*The English Convict*, p. 184); and that "the proportion of mentally defective criminals cannot be less than 10 per cent., and is probably not greater than 20 per cent." (*ibid.*, p. 179). In the United States, the use of the Binet tests has furnished figures extremely high and extraordinarily various: one investigator finds that "probably 80 per cent. of the children in the juvenile courts of Manhattan and Bronx are feeble-minded"; while the majority of other American writers fluctuate between a figure of one-third and one-half. Alive to the countless pitfalls that beset the inexperienced in their facile deductions from these methods, the most recent investigators have dropped to a figure far lower than that of the earlier testing enthusiasts. J. Burt Miner gives a proportion of 7.3 per cent. (*Deficiency and Delinquency*). Healy's figure I calculate at 11.2 per cent. (*The Individual Delinquent*, Table on pp. 131-2, including figures for both "morons" and "imbeciles"). Healy, however, still insists that among the personal characteristics of the offender "mental deficiency forms the largest single cause of delinquency" (p. 447).

extreme formulation of it, my own experience fails to concur. Both facts and figures seem in recent studies to have been greatly over-stated. The exaggeration springs chiefly from two kindred sources, from accepting an interpretation of deficiency that is far too broad, and from assuming criteria of deficiency that are far too narrow. As a rule, the criteria consist almost exclusively of tests; and these tests in turn are almost entirely of a scholastic or linguistic type. The interpretation of deficiency is at the same time defined so as to embrace, not only those who are genuinely defective in native intelligence, but also those who are merely dull or backward, sometimes those who are merely unstable, and not infrequently all who may be dubbed defective morally. At times, indeed, it is naïvely argued that, since crime is a defect, and since criminality is a mental, not a physical quality, therefore, mental defect may, without further evidence, be predicated of everyone who has committed a crime.

Mental deficiency is a technical term; and has now a fairly well-marked connotation. Adopting the line of demarcation generally accepted in this country in certifying cases for special mental deficiency schools, I find that, of the juvenile delinquents whom I have tested with the Binet-Simon tests, 7 per cent. are mentally defective. Seven per cent., that is to say, are children who are backward in intelligence by at least three-tenths of their age.[1] When ten years old, for example, they respond like normal children of seven or less; and, when adults, will at best hardly ever attain to the level of a normal child of eleven.[2] Among girls, particularly older girls drifting into sex-delinquencies, the proportion of defectives is distinctly higher than it is among boys; and among adults, particularly the habitual inmates of the prison, the proportion is higher still. When placed against the sensational statistics from America, my own percentage may seem low. In itself, however, it still reveals among the delinquent a proportion of mental defectives five times as great as among the school population generally.

Mental deficiency, therefore, is an important ingredient in the production of crime. Further, wherever it does co-operate, it plays the part, almost without exception, not of a mere contributory factor, but of a major, if somewhat negative, cause. Its mode of working is plain. The defective child has not the necessary intelligence to perceive for himself, or to hold effectively in mind, that what tempts him is dishonest, and that dishonesty is wrong—base in itself, and bad policy in the long run.

There are among delinquent defectives two or three broad types which it is useful to distinguish.

(a) Most commonly, when young, the defective is the mere tool and catspaw of others who are more intelligent. He is highly suggestible; and falls a facile prey to criminal ideas or vicious propositions put into his mind by accomplices of a richer invention or a bolder initiative. The more astute ring-leader may himself be sufficiently shrewd to elude discovery or to evade capture; and even refrain altogether from setting his own guilty hands to any enterprises likely to involve him in personal risk. But the foolish jackal is nearly always trapped.

(b) But frequently, when older, the defective plays a more active rôle. A child in intelligence, he may, in his emotions and in his sordid knowledge of the street, be a full-grown man. Yet, by virtue of his puerile intellect, he is still forced to associate, both in school and out of it, with children much younger and much smaller than himself. These, by his greater strength and size, and by

[1] See *Mental and Scholastic Tests*, p. 186.

[2] Since, however, by statute the definition of deficiency during school age is more comprehensive than the definition referring to adults, less than one-third of these school-defectives will be legally certifiable as mentally defective when they have passed the school-leaving age. The school defective belongs to the highest grade of deficiency: and the delinquent defective belongs usually to the brightest type of school defective.

his deeper worldly wisdom, he can often intimidate or provoke into deeds which their own little minds would never have imagined or dared. The defective is not always the harmless being he is often thought.

(c) In special directions the defective at times shows an ability that seems nearly or entirely normal. This sometimes puzzles the layman, failing, as he does, to discriminate special from general ability. Too often the technical efficiency of the criminal expert is held to acquit him of all suspicion of mental defect; but low cunning in a limited sphere is no proof of high intelligence. Some defectives possess a special linguistic capacity; and, as talkers, are fluent, plausible, and inventive. Other have a special motor ability; and are deft to execute such manual sleight-of-hand as is requisite for burglary or the picking of other people's pockets. Many again are normal, or even precocious, in the development of certain instincts; for example, those hereditary impulses that stimulate personal vanity or sexual desire. In a dull mind these special abilities and these precocious instincts are like matches or razors in the hands of a baby; useful in themselves, they are instruments of danger when foolishly misused.

On the other hand, there is undoubtedly an upper limit to the criminal ingenuity of the genuinely deficient. There are certain crimes which a defective of whatever age can hardly ever commit. He seldom forges; for he can scarcely write and barely spell. He seldom embezzles; for the arithmetic of all but the simplest transactions in money, lies wholly beyond his range. Fraud, too, where it rises above mere verbal misrepresentation, demands planning and resource; and even a coiner or receiver must have more sense and craftiness than will suffice for the practices of the petty thief. There are other crimes to which the defective seems particularly prone. To add violence to robbery is eminently characteristic of the deficient mind; and, among murderers, defectives are nearly twice as common as among those whose personal violence takes a less extreme and perilous turn. Malicious damage to property is, with the feeble-minded, a frequent ground of conviction; plainly, it is a less sapient mode of damage than burning insured property for private gain. With adult defectives, indecent assaults upon children, and sexual offences of an unnatural type, are commoner than is rape upon persons of their own age and size. Generally, therefore, the offences of a defective mentality are those of blind and childish impulse rather than of intelligent deliberation.

It will be remarked, however, that from first to last the influence of mental deficiency[1] as a pre-condition of crime, seems negative rather than positive, permissive rather than provocative. A boy of fifteen murders two little girls. The public and the press cry out that he must have been defective; and their utterances imply that his defect must have inspired his inhuman crime. The popular view, however, is a fallacious one. Of itself, mere lack of intelligence can hardly furnish the motive to crime. If a delinquent is genuinely defective, the criminal suggestion must first come to him either from some external source—a bad companion or a "crook" film—or from some inner instinct or impulse, such as easily expands, in a temperament that is unstable, to an excessive and uncontrollable degree. The deficiency itself simply removes some of the usual checks, which, based on prudence and rational insight, would restrain a more normal person from yielding to the force of such promptings.

Treatment. It is fundamental to a proper treatment of the defective criminal to deal with him, not as a criminal, but as a defective. The first requisite is to see that he is scientifically tested and examined by a qualified psychological expert. When almost half the juvenile delinquents appearing before the court

[1] Throughout this section I am using mental deficiency in the sense adopted by most psychologists namely, to connote a severe retardation in general intelligence, such as is disclosed pre-eminently by the usual mental tests. Temperamental deficiency, if the phrase be permitted, will be discussed in a later section.

verge upon the borderline of mental deficiency, and when a decided proportion of them definitely fall below it, there is plainly a pressing need, if only on this one ground, for the co-operation of a trained psychologist; practically every second case must call for technical testing. Special psychological experience and special psychological methods are more especially needful, first, to discriminate the genuinely defective from those who, from accidental causes or from mere physical conditions, appear so dull as to be indistinguishable from genuine defectives without a scientific examination and perhaps even detention in some residential observation-centre; and, secondly, to detect any additional disorder of mind or temperament, which, in a defective child, must obviously be more difficult to diagnose.

From its very nature, genuine and general mental deficiency is incapable of cure. Nevertheless, since its influence is so frequently a negative one, much leniency may be extended towards the first offender. If young, he should be committed to a special school. The additional supervision that this will entail, together with the association of the child with companions whose mental level is more nearly akin to his own, often of itself suffices to effect an immediate improvement.

The conditions obtaining out of school, however, are of crucial importance. The good that is done in the class-room may be altogether undone in the home or in the street. If the child's own family can make no provision for guarding him during the hours of leisure, then the very fact that he is kept continually watched and fully occupied during lesson time, puts him all the more at the mercy of the first mischievous temptation when he is released and left to himself. Defective delinquents, therefore, require unremitting vigilance out of school as well as within. Where this supervision cannot be supplied by the parents or guardians, the child, especially if approaching adolescence, and above all things if a girl, should be segregated in an institution or colony. There is no other measure. Permanent segregation is, in most cases, preferable, but is not always indispensable. After a spell of training in a suitable institution, a high grade defective, who is presently sent to a country farm, where temptations are fewer than in the streets of a city, will frequently do well, despite the worst of previous records. The mere circumstance that continued supervision keeps the child perpetually at work, and sees that he has always a place to work at, is in itself a guarantee for good behaviour.

It should not be forgotten that defectives vary enormously in temperament and in special abilities, more so perhaps than normal children. Individual study and individual treatment are, therefore, always needful. Moreover, additional complications are not uncommonly present among defective delinquents of a higher mental grade. Too often, having discovered that a child is certifiable, the examiner forgets to look further for super-added aberrations—definite tendencies to hysteria, for instance, and even symptoms of the graver psychoses. Whether mild or serious, the presence of emotional instability in whatever shape, yields an added reason for institutional seclusion.

Defective youths of an unstable temperament show a peculiar susceptibility to alcohol. And, indeed, given appropriate opportunities, deficient persons generally are apt to become an easy prey to intemperance, and to all the vicious consequences which a habit of intemperance brings in its train.

Special emotions—for example, anger, with its wild impulses to blind destruction or cruel revenge—are often developed to an extreme degree among these children. The sex-instinct in particular is at times unusually precocious; and, in a male defective, may lead to crimes of character exceptionally hideous. In these instances, Healy goes so far as to recommend a drastic surgical operation, not merely to prevent the creature from propagating his type, but also to eradicate these dangerous desires. With female cases, this remedy, simple but drastic, is not practicable; and defective girls who, by the very fact of a premature develop-

ment towards the age of puberty, reveal a physical basis for strong and early sexual impulses, should be isolated from all risks, until the habit of control has ben firmly established, or at all events until the ability to control has fully emerged. This again means either unfailing supervision, or else immediate transference to a residential place of safety.

2. Mental Backwardness.

If they are always not definitely defective, most delinquents are yet definitely dull. Of my total list of cases, over 90 per cent. sink below the middle line of average ability; and over 30 per cent. drop so far below it as to be classifiable as technically backward in general intelligence.[1]

There exists, as is now well recognised, no sharp line between mental backwardness and mental deficiency. Except for the few pathological cases belonging to the well-known clinical types—mongols, cretins, and the rest—cases which rarely come under notice for the commission of crime, deficiency may simply be regarded as an extreme degree of backwardness. It is natural, therefore, to find that, in the production of delinquency, mental backwardness operates in much the same way, though not perhaps with the same intensity, as mental deficiency. Crime, after all, is a simple, senseless way of gaining one's ends; hence, its perpetrators are principally those who, in the literal meaning of the phrase, are born simpletons; most rogues are also fools. Indeed, it is with detective officers a commonplace that the criminal, however adept he may become in his own particular line of knavery, can nevertheless be relied upon, almost without fail, to commit some minor piece of folly, to leave some clue behind, or to omit some obvious precaution, and so with his own hand to open up the way for his easy discovery and eventual arrest. There are, it is true, exceptions; and these are the most dangerous. But, fortunately for society, a Moriarty, a Raffles, or an Arsène Lupin, is far more uncommon in fact than in fiction.

The history of the backward delinquent, whether he is still at school, or whether he has quitted school for industrial employment, follows in either case pretty much the same general course. At school he drifts to the bottom of the class; and, under old-fashioned methods of teaching, becomes quickly branded as the dunce and the nuisance of his school. School itself not only loses any interest it might possibly have had for him, but rapidly comes to seem just a useless place of torment, a place where he is continually scolded or punished, a place where he learns little except that he himself is good for nothing, a place, in short, which it would be better to avoid. He soon begins to live up to the character he is given; and, to escape the drudgery of work for which he has neither aptitude nor inclination, takes readily to a life of habitual truancy. Truancy, indeed, is with most juvenile delinquents the first step on the downward stair to crime. The succeeding stages are self-evident. If a boy plays truant, he has from the outset to cover up his movements by prolonged and hardy lying. Having shirked one lesson, it will appear no more dangerous to shirk the next. Then, after once disappearing, it seems wiser to remain from home until evening, when parents are tired and perhaps in bed. And in this way meals are missed; hunger increases; and it becomes necessary to pilfer to satisfy the pangs.

In later life, the effect of maladjustment is very similar to that resulting at school. Owing to lack of normal intelligence it is difficult to find remunerative work; still more difficult to keep it; and almost impossible to perform the requisite duties, so as to avoid the reproaches of the foreman and the contempt of fellow-

[1] For precise statistics, see *Mental and Scholastic Tests*, pp. 134 *et. seq.*. I may explain that by technically backward I understand a child who is retarded in mental development by more than 15 per cent. and less than 30 per cent. of his true age. Thus, a child of ten who, without being absolutely defective (that is, without falling below the level of an average child of 7), is yet beneath the level of an average child of 8½, is termed "backward" in this special sense.

workers. Once more, therefore, the backward person begins to make up by illegitimate means—by shirking, by deceiving, by lying, and at last, by stealing—for what he has lost from lack of general competence.

Treatment. Many social workers would be disposed to stretch some clause in the Statute-book, and to have these cases certified for institutions as mentally or morally deficient. Certainly it is an essential characteristic of the congenitally backward that, both during school life and afterwards, they can never compete on equal terms with their fellows; and this inequality in social competition was at one time put forward as the distinguishing mark of the defective. If, however, we are, on this ground, to regard every backward person as deficient, we should soon find that one-tenth of the population had to be treated, in theory at any rate, as certifiable, and as suitable for institutional care. Ten per cent. of the population are technically backward. But these ten per cent. are not all criminals. Most of them are too dull to be dangerous.

It may, indeed, be suggested that, as public opinion advances, and as more liberal funds are granted for such purposes, it will become practicable to raise, step by step, the limit of demarcation for certifiable cases; and to segregate the most seriously backward, at any rate when their backwardness is coupled with a propensity to crime. But to this simple measure, threatening, as it would, so deep an encroachment on the liberty of so large a section of the population, there are drawbacks both social and psychological. An intermediate course might be to organize residential homes or hostels, where the inmates should enjoy far more freedom and independence than they can be granted in the existing type of institution. Under such a régime an adjustable amount of supervision could be given, and an adjustable amount of control could be exercised in regard both to leisure hours and to money matters; while the young person would be free to go to and fro to his work, and even, within certain limits, to turn where he liked, after work was over, for recreation and amusement. This solution seems particularly commendable for mentally backward girls during the critical period that extends from the beginning of puberty to the end of adolescence.

But, even so, it is hardly just, and it is beyond doubt scientifically unsound, to treat the commission of a crime as a psychological pretext for segregation, co-ordinate with the possession of an undeveloped intellect. One fatal consequence would be to herd together in close association criminals of totally different types, regardless of the real origin of their criminality. To give this measure a pseudo-psychological colour by talking, not of the fact of crime, but of a propensity to crime, is simply to obscure the fundamental axioms that propensities to crime are of a very different nature in different individuals, and that something approaching to a propensity to crime exists, in one shape or another, in every man of us. As with deficiency, so with backwardness, the feebleness of mind is, in fact, usually a negative, or at most an aggravating condition; and the precipitating factor, whether residing in the individual or in his environment, whether hereditary or acquired, calls for thorough psychological investigation, before it can be fairly treated either by segregation or otherwise.

At the younger stages, the most important broad administrative measure is the organization of special classes, and perhaps even of intermediate schools, for the backward child. Here he would receive something of that extra supervision accorded in the special school to the mentally deficient; and the curriculum would be so framed as to relieve him of the burden of scholastic work that is absolutely above his level, and to give him concrete manual work that will absorb his energy and arouse his interest, and in some degree prepare him for the actual tasks of his after-school life. This is being done upon an increasing scale by the initiative of head teachers themselves; and certain education authorities—for example, those of Birmingham, Coventry, and London—have lately carried out surveys to estimate the number of backward children within their area, with a view, as soon as the

present economic crisis is over, to making definite administrative provision for them upon a general scale.

The measure would be preventive as well as remedial. By far the greater portion of our potential criminals would then pass through the meshes of the backward class. And it would thus become possible to cope with almost the whole problem from the very earliest beginnings—to study individual cases, to strengthen the weak intellect, and to fortify the infirm will, before the habits of delinquency became thoroughly ingrained, and often before any criminal temptation was encountered or experienced. Much, indeed, has already been accomplished in this direction. And those visiting the backward classes already existing are uniformly struck to see what a stimulating reaction upon temperament and character is produced by furnishing suitable intellectual work and suitable intellectual interests, adjusted to the low level of these backward individuals. Provided the transference to a backward class involves no brand or stigma, the children committed thither, finding that there is after all a species of work at which they can succeed, begin not to lose but to gain in self-respect.

The dull and backward are often acutely conscious of their own misfortune; and a dim, half-realised sense of their psychical inferiority may sometimes operate like a buried grudge or grievance against the world in general, or against their luckier relatives and school-companions. Except, however, with the comparatively brighter cases, a complete psycho-analysis is, at any rate in my own experience, always difficult and usually fruitless. Psycho-analysis calls for an intelligent and introspective co-operation on the part of the patients; and this from the backward can hardly be obtained. Indeed, with them re-education, and a character-training of whatever kind, must be content with the humblest procedure. It can seldom follow the lines of rational insight, of a self-analytic understanding of self; and must approximate rather to such crude forms of training as are adopted with the higher animals—the simple breaking of bad habits through pain or the subtraction of pleasure, the simple strengthening of good habits through the addition of pleasure and the bestowal of encouragement, the punishments being always swift, certain, and consistent, and the rewards equally immediate and equally designed to appeal to the native instincts of the child. With such cases, actions are more effective than words. They should be talked to, and talked at, as little as possible. Moral instruction is of small use; and most demoralising of all is the repetition of threats which are rarely enforced.

Of the two modes of habit-formation, that which works through pleasure and reward is usually more productive than that which works through pain or deprivation. And this method of rewards can be carried through most easily in the freedom of the home. I have, however, known several cases where the dull delinquent has developed very favourably, when removed to the discipline and restraint of a good reformatory or industrial school. Where there are two or three delinquent children operating together within the same family or within the same gang, it seems a just policy to sacrifice the duller to save the brighter; to transfer the former to a place of confinement, in the hope that the other—though, perhaps as the prime instigator, he may seem the guiltier of the two—may, nevertheless, while still at large, with a practical warning thus before his mind, deprived, too, of the admiring assistance of his tool and ally, spontaneously give up his criminal practices. In juvenile colonies, and in little commonwealths for delinquents, the very dull, in my experience, seldom make good citizens.

It is chiefly with cases of this dull type that I have found a helpful resource in hypnotic suggestion. With brighter children, psychological treatment of a more thoroughgoing kind is not only possible, but also, it would seem, necessary, at least for permanent success: they are, too, often more restless and unstable, sometimes more critical and contra-suggestible, and so more resistive to hypnosis. The moderately dull child, on the other hand, is often highly suggestible, for good as well as for evil.

For purposes of ordinary therapy—relieving headaches or curing mild functional troubles, like ties and troublesome mannerisms and habits—a profound state of trance is not essential; but, in handling delinquency, the deeper the hypnosis, the better the result. This means numerous and rapidly repeated sittings—preferably, to begin with, one every day for the first week or fortnight, followed by a series of treatments with the intervals progressively prolonged, as soon as evidence of successful post-hypnotic influence is obtained. Suggestion seldom produces any definite outcome, at any rate of a lasting character, unless the patient's personal desires are to some extent already running in the direction that is to be suggested. It is, therefore, most efficacious where a child is beginning to grow tired of his delinquent escapades and of the trouble they entail; but, either from shame or pride, or from the long-standing domination of a chronic habit, is unable, without some independent help, to give his genuine desires effect. At the outset, the moral suggestions must not be too obtrusive. The first few sittings, indeed, should be devoted to a sort of hypnotic training, enabling the hypnotist to gain some insight into the reaction of his patient, and the patient to gain confidence in the goodwill of the hypnotist, so strengthening *rapport* and increasing control. Even in the later stages, suggestions are commonly the most beneficial when they are positive rather than negative, concrete rather than abstract, indirect rather than direct, when they deal with definite feelings and sensations rather than with impulses, desires, or mere prohibitions. To say, "Tobacco will taste nasty and bitter; cigarette smoke will make you feel ill and sick," will be found more effective than to declare, "You will never want to smoke again," or "You will never again take money for cigarettes." To suggest, "Whenever you see money lying about you will feel impelled to put it under the clock on the mantelshelf, and to tell your mother where it is," will be more likely to succeed than to assert, "You will never again steal money from your mother."

With brighter children, hypnosis is also occasionally helpful in explorations of a quasi-psycho-analytic kind, when there is considerable resistance, whether from shame or from genuine repression, to the confessions involved. Where a child says, "I can't remember," the mildest effort of suggestion will often help him to remember. But, as a rule, it is far better to deal patiently with the resistance by the full technique of psycho-analysis, wherever time and the child's intelligence allow. Nor is it ever desirable to attempt to hypnotise him before first obtaining the consent of his parent or guardian.

3. Educational Backwardness.

So far I have been discussing primary or inborn backwardness, that is, arrested development of natural ability; and I now turn to consider what may be called secondary backwardness, backwardness merely in acquired attainments, or, in one word, ignorance. Among juvenile delinquents the most startling fact is their extraordinary lack of knowledge: it is with them both more frequent and more profound than any other intellectual failing. They are ignorant alike in the narrower respect of the simpler scholastic subjects—reading, writing and arithmetic, and also in the broader reference of general information and culture.

Ninety-eight per cent. of my cases fall below the middle line of average educational attainments; 42 per cent. are so far below it as to be classifiable as technically "backward" in school work.[1] Of these, nearly 11 per cent. might be termed "educationally deficient";[2] they are, that is, quite as ignorant as the congenital defective attending a special school. These figures include the children

[1] By 'technical backwardness' I mean retardation to the same extent as before, that is by more than 15 per cent. and less than 30 per cent. of the chronological age.

[2] By 'deficient' I mean as before retarded—though now not in inborn ability, but in educational attainments—by 30 per cent. or more of their age.

for the foregoing categories, namely, the mentally deficient and the mentally backward; but the several pairs do not altogether coincide. Inborn deficiency or backwardness almost invariably results in deficiency or backwardness in educational acquirements; but deficiency or backwardness in educational acquirements may be due to other causes than that of inborn incapacity. The dull are nearly always retarded; but the retarded are not necessarily dull.

Of those whose educational backwardness is merely secondary, there are various classes or types, each of which should be considered according to its own special nature. With many the backwardness is due to a large extent to physical causes, to disease, ill-health, and the usual list of bodily ailments that delay the progress of the child at school. In other cases the backwardness is attributable to some limited disability of a psychological kind, some temperamental defect, or some defect of memory or attention. With the delinquent child the backwardness has very commonly a moral origin. He is recognised in class as the lazy child, the obstinate child, the unmanageable child. Often, like the inborn dullard, an habitual truant, he will also shirk his lessons, even when present in the class-room; and then, as a rule, is tempted to make up his shortcomings—with greater cunning than his duller colleague—by cheating, copying, and other illegitimate means. One dishonesty leads easily to another. It is no long stride from stealing your neighbour's ideas to stealing your neighbour's wealth.

The delinquent, however, is not only ignorant in the special subjects of the school. He possesses also, as a rule, the most scanty knowledge of informational topics generally, particularly those of a more intellectual character, such as the details of municipal and political government, and the popular items of practical physics and engineering. It is instructive to draw up a testing-scale for general information, arranging the questions according to the successive ages at which on an average they are answered. Measured by such a test, the criminal youth appears a woeful ignoramus. Most boys of his years, and of his general mental level, will have a hobby—collecting postmarks, studying locomotives, making toy aeroplanes or kites. He has none. If he reads, it is a picture-paper, or a coloured comic, or the escapades of "Deadshot Dick and the Avenging Nine." If he goes to any place of amusement, it is to a fun-fair, or a cinema, from which he gleans indeed astonishingly little that is of any intellectual worth. He plays no games that calls for much intelligence or skill; and his athletic accomplishments are usually far slenderer than those of the normal youth of his school or neighbourhood. Hence, his mind is utterly empty; he has no progressive interest; and, with nothing to occupy his leisure hours, it is small wonder that, in the search for stimulus and relaxation, he lights only upon enterprises that in a civilised community are held to be vices or crimes.

Treatment. These cases of educational backwardness are among the most hopeful that one can have to deal with. Since their general intelligence is but little if at all below the normal, there is every hope that, as they grow up, they may perceive the folly of a career of delinquency and settle down in the outer world to a life of respectable work.

During childhood, as with the congenitally backward, so with the educationally backward, the most useful measure is transference to a special class for the backward child where the backwardness is mainly secondary. Such transference, however, will now, as a rule, be temporary. If the child's lack of adequate school knowledge rests upon no inborn basis, then proper attention to health and attendance and a tactful appeal to his natural interests should gradually lift him up to the normal. A sympathetic approach is essential: school and school work should be made so fascinating that these young defaulters come actually to prefer lessons to truancy, and the class-room to the street. Often the mere removal to another class or to another school operates as a sharp warning; and removes

the ingrained friction that has probably grown up between the child and his previous teachers.

Where an intelligent boy or girl, of excellent health, attending regularly at school, and showing no special inborn disabilities of temperament or intellect, still fails to make progress in his lessons, it is essential to search for emotional reasons. Hidden mental conflicts, and what may comprehensively be termed psycho-analytic mechanisms, are far more commonly to be found in those whose intelligence is nearly normal than in those who are innately backward. Often some such "complex" (to adopt the current phrase) lies at the root both of the apparent backwardness and of the delinquency. There may be some repressed hostility to the teacher, some secret antipathy to a special subject, some revolt against all authority and restraint as such, of which the child himself is barely conscious. Psycho-analysis, or treatment upon psycho-analytic lines, may, therefore, be doubly successful; and end by restoring the child to normal behaviour both in school and out of it.

Express attention should be paid to those who suffer from some limited form of backwardness, who are retarded in one subject of the curriculum only. A number of my cases include small boys of eight or nine, who are normal in general intelligence, and quick at simple arithmetic—particularly where money sums are concerned, but who yet cannot read the easiest two-letter words and barely recognise the characters of the alphabet. Often their illiteracy is in part hereditary: and their fathers and mothers prove to be persons of a rough, irresponsible coster type who themselves can neither read nor write. Against the freer atmosphere of the infants' school they have not rebelled. But upon promotion to a senior department, with its stricter discipline, its sedentary habits, and its call for book and paper work, their repressed energy breaks out; and, even if they do not try to avoid, by truancy, the reproofs and punishments to which their ignorance so often exposes them, they give way very readily to anti-social conduct out of school.

At an older age the poor reader suffers another serious handicap. Not only is he shut out from many of the better spheres of employment to which his intelligence might otherwise entitle him, but he is also cut off from all the boons of literature, from the most valuable form of quiet recreation, and from the most helpful source of intellectual, moral, and æsthetic improvement. To him every book is a closed volume. He remains, and feels himself remaining, an uncivilised barbarian, in the midst of a civilised society; and is apt to act accordingly. The boy, therefore, who is bright but backward, may learn nothing else that school usually teaches; but he should at least be taught to read.

With every delinquent an effort should be made to build up healthy and progressive mental interests; nothing can kill a passion for something criminal, except a greater passion for something which is wholly legitimate. With the child whose ignorance is general rather than scholastic, the need for a broader type of education is doubly requisite. Here the usual school curriculum might with profit be extended; and include among its aims the transmission of those wider and humaner interests, of those floating stores of common knowledge and popular information, which, with children in more prosperous circumstances, would normally be supplied at home. In the home of the delinquent, life is too often deplorably empty. The child is perhaps an only girl, or the youngest child whose brothers and sisters are one and all grown up; yet neither father, nor mother, nor other relatives, trouble to see that her free hours are wholesomely filled, or to find her congenial companions, or to enter into companionship with her themselves. Or, again, the child may be a growing boy, the eldest of a family whose other members are infants; and he is left to entertain himself amusing the little ones, or by toying and trifling with their babyish playthings: books, games, tools, building blocks or meccano outfits—there is nothing of this sort. Once the defect is pointed out, most parents, however poor, will do something to remedy

it. But usually they themselves are too ignorant to do much. Here, then, is the opportunity of the school, and the chance for the teacher of the backward class. Training for leisure is quite as essential with the backward as training for industrial life : and far more important than spelling or grammar, or decimal fractions. But, once more, for the best results, a sympathetic study of the individual is essential. Not infrequently some unsuspected vein may be struck—an interest in wood-carving, a talent for painting, a whim for collecting and classifying flowers; and the new-found hobby or recreation will open up, by an instantaneous magic, a salutary outlet for self-expression and superfluous energy, which hitherto school and home had alike left running to waste.

(To be continued).

THE UNITY OF MENTAL PROCESSES.

By W. Whately Smith, M.A.

THE object of this paper is two-fold. First, I wish to urge, very briefly, the desirability of making a determined attempt to give an explanation of all mental processes in the simplest terms; in terms, that is to say, of the minimum number of irreducibles; and secondly, I shall try to indicate, by means of one or two examples, the kind of way in which I think that this may be done.

I have called the paper "The *Unity* of Mental Processes," because I believe that in psychology, as in other sciences, it is possible to explain all the diverse phenomena with which it deals as the outcome of a very few simple and elementary laws, which are operative throughout them all and which exhibit them as parts of a coherent whole rather than as discrete and discontinuous. I doubt whether this has been done in psychology to anything like the same extent that it has in other sciences, and this omission appears to be one of the most serious defects in the present treatment of the subject.

For every science has registered a most notable advance when it has obtained this co-ordinating stage. Thus our mastery of astronomy, for instance, dates from our reduction of its various phenomena to terms of the laws of mechanics and of gravitation; the bewildering variety of chemical reactions only become comprehensible when Dalton propounded his atomic theory and the simple laws of chemical combination were enunciated. The doctrine of evolution similarly brought order into the previously chaotic field of biology, and the concept of the luminiferous ether enabled us to unify the apparently disconnected phenomena of light, heat, electricity and magnetism.

I suspect that in psychology we are too apt to keep our "explanations" in water-tight compartments, and to be content with their isolation. Thus we talk of dreams and sublimations, of conversion hysterias, compulsion neuroses and repressions, of amnesias and fugues, of hypnosis, suggestion and resistances, almost as if each were a distinct process of *sui generis*, and we make very little effort to show how they are all inter-related, or how precisely the same mechanisms underlie them all. It is true that this is, and must always be, convenient, just as in

astronomy we find it convenient to talk about the sun rising and setting, or about eclipses, precession, nutation, tidal friction, and so forth. But astronomers are prepared to explain all these phenomena in terms of the fundamental laws of mechanics, and have, indeed, long ago so explained them, whereas it is at least doubtful whether psychologists are yet in a position to do the same for the phenomena which they study.

I do not think that it is wholly unfair to suggest that modern psychological exposition is open to the same kind of criticism as was rightly directed against the old faculty psychology. Exponents of the latter system were accustomed to "explain" mental phenomena by ascribing them to the exercise of the faculties of discrimination, perception, judgment, reasoning, imagination, and the like. This procedure was justly condemned on the ground that it did not really explain the phenomena at all; for explanation consists essentially in re-description in terms of fewer irreducibles than were primarily necessary, or in the re-statement of the obscure in terms of the less obscure, and this is not effected by reduction of phenomena to terms of many and diverse faculties which themselves remain unexplained. The present state of affairs is not nearly so bad, but a tendency of somewhat the same nature is certainly observable to-day. We are apt to speak of dreams, for example, as consisting of a regression to more infantile or primitive modes of thought than those responsible for the mental process of waking adult life, and to talk of the abrogation of rational control, or of the supersession of higher by lower centres regardless of the fact that such words as regression, abrogation and supersession themselves introduce new problems which are left unsolved.

I do not wish to imply that such efforts at explanation are wholly abortive. On the contrary, to conclude that the phenomena of dream life closely resemble the processes observable in primitive or infantile man is a most interesting and valuable achievement, but I submit that it does not appreciably advance explanation in the proper sense of the term. It is valuable in the same sort of way as was the recognition of the fact that the revolution of the moon round the earth is the same kind of phenomenon, and presents the same kind of problem as does the revolution of the earth round the sun.

But this is only a small step in the process of explanation, which is not seriously advanced until we are able, not merely to recognise problems as similar but to solve them in terms of general formulæ applicable to all the phenomena concerned.

Thus in the particular case which I have cited, it is not sufficient to point out the similarity between the mental states

and processes of infants or savages and those which occur in dreams; it is necessary also to give some description of the laws of mental processes *in general*, and to show why their operation in dream-life yields results of an approximately infantile or primitive character.

In order to do this thoroughly would involve a complete exposition of psychological theory which is obviously beyond the scope of the present paper, and I must therefore ask for leniency if I indulge in somewhat abbreviated and dogmatic forms of statement which in other circumstances I should attempt to justify.

In doing this I shall have occasion to speak of conflict between different systems of ideas—a principle which I believe to be absolutely fundamental to the foundation of the laws of mental activity. I cannot here discuss in detail just what I conceive to be the origin and mechanism of conflict, or how that quality of mental states which we call "affective tone" is precisely determined by it. But I think that it will be possible to justify my use of the phrase by means of empirical illustrations.

We are most of us familar nowadays with the concept of "complexes"—associated groups of ideas, that is to say, which are described by psycho-pathologists as lying buried in the unconscious, and as incapable of being brought into consciousness on account of the force of repression.

But to say that a complex is repressed is merely to say that it is of a nature so incompatible with certain other systems of ideas—constellations, sentiments, or whatever we please to call them—that its accession to consciousness would be productive of intense conflict accompanied by intolerably disagreeable affective tone. This is indeed the essence of repression, and would be admitted to be so by the great majority of modern psycho-pathologists. The least misleading analogy is perhaps that of two bodies carrying similar electrical charges, of which one represents the complex, the other the sentiments, etc., aforesaid. So long as these are remote from one another—so long, that is to say, as the complex is repressed in the unconscious—the repulsive force between them is negligible. But if the outlying one be brought, for any cause, near to the other, the repulsion—that is to say, conflict—rapidly increases.

Probably the best and simplest concrete instance of this is to be found in the word-association test. When a stimulus word "strikes a complex," as we say; when, in other words, it tends to arouse by association a group of repressed ideas, the latter are, so to speak, drawn towards the surface, conflict is set up, and, as is well known, certain easily observable effects are produced.

Here we have a clear example of conflict between two different elements in the mental content—between the complex and other systems of ideas. But we have no right arbitrarily to divide the systems of associated ideas which constitute mental content into two radically distinct and opposed groups of sheep and goats—complexes on the one hand and non-complexes on the other.

I maintain, on the contrary, that repression is a process or force capable of quantitative variation, and that different systems of ideas, constellations and sentiments may conflict or harmonise with each other in infinitely varying degrees. Nor can we suppose that it is only such specific stimuli as those of the word-association test which tend to arouse those complexes or constellations which at any given time are banished from consciousness. Any situation contains elements tending to arouse all kinds of systems by association.

Mental activity consists in the coming and going in consciousness of various combinations of presentations, images, or ideas, a flux which is determined on the one hand by the sense-data which constitute the momentary environment—on the other by the stored content of the mind and the laws which govern the interaction of the different elements of this. So far as these laws are concerned they may, I suggest, be summed up by saying that "the aggregate of presentations which occupies the field of consciousness at any moment is succeeded by such other presentations as being associated therewith are productive by their presence of the minimum degree of conflict."

I cannot devise any really satisfactory physical analogy to illustrate this principle, and perhaps this is just as well, for analogies are always dangerous. But it is not, I think, difficult to grasp and accept the general idea of different groups of presentations being drawn, as it were, towards the field of consciousness by virtue of their association with those already therein and jostling each other, crowding each other out, on account of the conflicts between them and the repulsion consequent thereupon.

I cannot, here, amplify or defend this way of envisaging mental activity, but I do not think that it is likely to arouse serious opposition, for it closely resembles the form of exposition adopted by many authorities.

I am anxious, rather, to turn to more concrete points such as the similarity, mentioned above, which has been observed between dream processes and those of primitive and infantile mental life. But in order to bring out as clearly as possible the nature of the view which seems to me to establish a real unity between them, I think it will be best to consider rather more closely one point

concerning this flux of presentations under the influence of the law of minimum conflict.

This is the question of why, in a case where two or more groups of presentations are productive of conflict as a result of their juxtaposition in consciousness, one group should prevail rather than another. I have spoken, for instance, of a "complex" being denied accession to consciousness because of the acute conflict which its presence would engender, and have implied that this is only a specially intense case of a general process. But I have deliberately evaded the question of why *it* and not the other systems with which it conflicts should be worsted and repressed.

It is no use to say that the "other systems"—cultural, ethical, social, practical, or what-not—are "larger" or anything of that kind, for to do so tacitly assumes some psychical analogue of size or inertia which we have no right to do. And to talk of their being "more important" is meaningless for the present issue. So far as I can see there is nothing to choose on *a priori* grounds between complexes based directly on crude, primitive, instinctive cravings and the more elaborate cultural or ethical systems which after all are elaborated from the self-same fundamental necessity of adaptation to environment.

If this be conceded, it is clear that we must look further for the reason why these latter systems commonly prevail in the waking life of the civilised adult. We are here dealing with precisely the same question as Freud is when he contrasts the pleasure principle with the reality principle, and claims that as infancy is left behind the latter supersedes the former. The antithesis between the pleasure and reality principles is identically the same as that between the systems based on primitive cravings and those in conflict with them which I have referred to above.

The problem is why the systems corresponding to the reality principle should prove more powerful than those corresponding to the pleasure principle, why the former should, in normal waking life at any rate, be less easy of displacement than the latter.

I believe that the answer is a very simple one. I believe that what I may call the reality systems are kept in the foreground of consciousness, so to speak, by the stream of sensations of one kind or another which—in normal waking life at least—constantly pour in upon us. In sleep, when these streams of "sense-data" are wholly or largely cut off and when, consequently, our previous experience of the contemporary world is no longer brought constantly into play by association, we

function in much the same way as do infants and savages who have never had that experience at all.

With this point I dealt rather more fully in an earlier number of *Psyche*,[1] and I will not repeat my contentions again here. I may illustrate the point I wish to make at least equally well by a brief discussion of Symbolisation, which is most often considered in connection with dreams, but is of equal importance in the study of hysteria and of sublimitations. In such psychological contexts the term is used somewhat differently from that which is customary. As a rule we mean, or should mean by the word symbol something—a mark on paper or a particular sound—which is used, as a matter of practical convenience, to refer to something else. But in psychology this element of intentional reference is lacking. When we say that something in the manifest content of a dream symbolises something else, we do not mean that the images, etc., concerned are used, for means of practical convenience, to *refer* to the thing symbolised; we mean, rather, that one set of presentations has been in some sense *substituted* for another. And similarly when we speak of an hysterical movement, for example, being a symbolic satisfaction of an expressed wish, we do not mean that the movement symbolises the activity in the same way that certain deliberate ceremonial observances or pieces of ritual symbolise events or procedure which cannot be executed in their original form.

In this latter case the deliberate ceremonial action is intended to recall the original to the minds of the participants; it possesses the essentially symbolic quality of *reference*. But symbolisation in dream, hysteria, or sublimation is more in the nature of being the closest approximation to the motivating wish or tendency which is practicable in the circumstances.

The dream symbol is essentially a compromise determined by the same law of minimum conflict which I referred to above. For even in sleep, or at any rate in that state immediately antecedent to waking of which alone we appear to possess any knowledge, the influence of reality systems is not wholly absent. It is very much weakened for the reasons mentioned above, but is still enough to occasion a certain amount of conflict with the more primitive pleasure systems. Consequently the presentations directly originated by the latter would produce more conflict than do others associated with them, and it is these, therefore, which rise to consciousness rather than the originals. Moreover, it seems probable that besides the residual influence

[1] (*July*, 1921, pp. 62 and 63.)

of the reality systems, there may well be circumstances in which different pleasure systems may be in opposition to each other, and this would also mean that some group of presentations indirectly associated with both would be productive of less conflict than any group directly associated with either.

Dream processes like those of waking life are, in fact, determined by the *whole* of the mental content, and the aggregate of presentations which constitutes the content of consciousness at any given moment must be such as is in equilibrium with *all* the forces which are operative. It is this perpetually shifting equilibrium under the influence of all the various incoming stimuli—including, of course, those of endo-somatic origin—which constitutes mental activity. In the absence of *any* change of incoming stimuli an entirely static condition would be produced.

If we once grasp this general idea of the determination of every mental state by the whole of the mental content according to the law of minimum conflict, we find that an immense number of processes commonly referred to by different names, fall into line as mere variants in the central theme.

Thus "condensation" and "over-determination" are at once seen to be obvious and inevitable effects of the law. These terms admittedly are no more than refer to different aspects of the same process—an element of the manifest dream content is found to be determined by many factors and thus is called "over-determined" while, from the other point of view the influence of all these many factors is said to be condensed in the production of that element. But this is no more than a limited mode of expressing the fact that the elements of the dream or any other mental state must be such as to be in equilibrium with regard to all the operative forms.

Similarly we need no longer talk about the "Censor" except for descriptive purposes. Freud himself says that this concept is only an expression descriptive of the effects of the sum total of the repressing forces, and would probably be very willing to admit that the principle of minimum conflict can satisfactorily be substituted for it. But although the word is convenient it is apt to be misleading and to induce a too anthropomorphic conception of mental forces. Especially is this the case when Freud speaks of there being a censor between the unconscious and the preconscious, and speculates as to whether there may not be another between the preconscious and the conscious. This arbitrary division of the mind into strata or tracts seems to me to be thoroughly unsound. We can never hope to deal satisfactorily with psychological problems until we have acquired a

point of view which envisages the mind as a continuous *unity*, a unity as coherent and as homogeneous in the universality of its laws as in any physical system.

I believe that the general conception of systems of "ideas" constantly shifting in such a way as to maintain equilibrium determined by the law of minimum conflict, will in time enable us to express all mental phenomena in terms of very simple laws, and to achieve that co-ordination the desirability of which I emphasised at the beginning of this paper.

RECENT WORK IN PSYCHICAL RESEARCH.

By E. J. Dingwall.

DURING the last few months there has been a good deal of activity in centres where Psychical Researchers are wont to gather. One of the most important events was the meeting of the first International Congress for Psychical Research at Copenhagen at the end of August, 1921, when a number of papers were read and discussion instituted.[1] The weak point of the Congress was apparently the lack of any kind of co-operation amongst professional psychical researchers, since the barrier of language was not broken down by the judicious use of trained interpreters.

In England, the chief points of interest have been concentrated upon the book tests of Mrs. Leonard, spirit photography, and the séances of Miss Besinnet. In Part LXXXI. of the *Proceedings* of the Society for Psychical Research appeared a paper by Mrs. Sidgwick examining the book tests of Mrs. Leonard, but we have not yet seen any serious criticism of these tests by a competent psychologist. Apart from their immense psychological value, they constitute a series of phenomena of a special interest since their very nature precludes the possibility of telepathy unless this hypothesis is strained to the utmost limits. Indeed, the entire absence of criticism from psychological quarters suggests in this case something more than that the psychologists are ignorant of the phenomena themselves. On all sides are symptoms of a gradual awakening of the sleeping psychologists to the enormous mass of material which has remained to them a sealed book owing to their prejudices, timidity, and remarkable credulity. Their complete silence on the mediumship of Mrs. Leonard implies perhaps that they are beginning to think a little for themselves instead of taking for granted the so-called "explanations" of persons who have no acquaintance whatever with the subject in dispute.

The controversy over spirit photography still continues. A new medium has appeared who has been giving remarkable results, and the whole subject deserves the careful consideration

[1] Reported in "Psyche," October, 1921, pp. 172–174.

of psychical researchers, if only they can persuade the spiritualists that it is of no interest to anyone to prevent a proper investigation, but on the other hand does great harm to themselves and throws what may be wholly undeserved suspicion on their mediums.

Amongst physical mediums, England has been favoured by a visit from Miss Ada Besinnet, the "Anna Burton" of the report of over 670 pages published by the American Society for Psychical Research in April, 1911. In a great number of cases, the sitters at her séances were unaware of the existence of this report, which showed in great detail that the bulk of Miss Besinnet's phenomena was produced by herself in abnormal mental states, thus constituting a valuable example of hysteria in connection with alleged mediumship.

Speaking of Miss Besinnet, it is curious that her native land should at the moment be so destitute of good mediums, Mrs. Chenoweth, of Boston, being the only well tested psychic for trance work. The Department of Physical Phenomena of the American Society for Psychical Research has been doing a good deal of work in alleged supernormal photography, but unfortunately when controlled conditions were instituted the phenomena ceased. Amongst materialising mediums the same fraudulent practices go on as usual, and indeed it seems difficult to believe that any but an American audience could be taken in by the exhibitions of luminous cheese cloth, which are held twice a week in the very heart of New York City. Well tested materialising mediums are extremely rare, and in France, Dr. Geley is to be congratulated on securing the services of Franek Kluski, a Pole, who produces the most extraordinary phenomena and a full account of whose work we hope will be published in the near future. According to Dr. Geley's report, he has obtained impressions in wax of materialised hands, these impressions revealing all the details including bony structure, muscles, tendons, and even the furrows of the skin. It is said that these hands do not resemble the hands of the medium. Materialisation of human faces have also been observed. They are of natural size and appear usually behind and at the side of the medium, but higher than his head and those of the experimenters. The faces appeared to be alive; they gaze keenly upon the experimenters, and the grave and calm appearance of their countenances reflected a severe dignity as if, according to Dr. Geley, they were conscious of the dignity of their rôle. Amongst other strange manifestations the materialisation of animal forms are alleged to have occurred, phenomena which even more than the others, will need an enormous weight of evidence in their support.

Besides being a supposed physical medium, he is an automatic writer, and the mental side is intimately connected with the physical manifestations.

The medium, Eva C., is still giving sittings in Paris under the direction of Madame Bisson, and her phenomena do not seem to be losing anything in their intensity and physiological interest. Dr. von Schrenck-Notzing, who previously investigated this medium, has lately been turning his attention to hauntings and poltergeists, and has recently reported an important case near Weimar in which the phenomena were witnessed by a large number of people. It appears that Madame Sauerbrey, a nervous invalid, was hypnotized by her step-son, Otto Sauerbrey. She soon became worse, loud raps were heard in her vicinity, and she began to suffer from what were supposed to be hallucinations (conversing with imaginary persons in the room). The raps occurred all over the house, but appeared to stop when the patient spoke, while objects in the kitchen were alleged to move without contact, but rarely in broad daylight. The dog showed some signs of fear whilst in the house, and finally the police were called in, many of whom bore witness to the facts. A physician from the neighbourhood of Weimar attended the woman, and made some experiments. He endeavoured to persuade the patient that she was able to resist the influence exercised by Otto Sauerbrey, and his ministration met with some success, for about a fortnight after the manifestations had begun, the woman suddenly cried out saying that she was free, and from that day the phenomena ceased.

The case is obviously of great interest from whatever point of view one chooses to regard it. As supplementary evidence to that already gathered in favour of the reality of hauntings and poltergeists it is important, and also for the light it throws on physical "mediumship," which if one can judge from the reports, was exercised unwillingly by the victim of suggestion.

FOREIGN INTELLIGENCE.

[*We are glad to be able to announce that we have made arrangements whereby regular instalments of notes from foreign sources will be contributed by competent authorities abroad. These will include comments on the progress of psychology in the countries concerned, together with abstracts of such periodicals and books of importance as are not readily accessible to English readers. The latter will be found in our "Survey of Current Literature." We publish a preliminary instalment of General Foreign Intelligence below, and propose, in the near future, to extend our arrangements to cover all centres of psychological importance.*]

PSYCHOLOGY IN THE UNITED STATES.

The last two years have witnessed, as might be expected, increased interest in the fields of mental testing and applied psychology; and, if the great war has not advanced the growth of American psychology to the same extent as it has British psychology, it is due perhaps to the operation of the Weber-Fechner law. This country for some years had taken the lead in the world as a psychological market, so that there was no inertia to overcome except such as was incidental to the situation created by the war.

Within the last year, the *Journal of Applied Psychology*, the *Journal of Abnormal Psychology*, and the *Journal of Experimental Psychology*, the publication of which had been temporarily suspended, have re-appeared with renewed vigour, while other periodicals like the *Psychological Bulletin* and the *Journal of Educational Psychology*, which had been lagging behind, are gradually catching up in their issues. A new publication—the *Journal of Comparative Psychology*—under the joint editorship of Dr. Yerkes and Prof. Dunlap, takes the place of the *Journal of Animal Behavior and Psychobiology*. The *Psychological Bulletin* is now devoting practically all its space to special reviews and abstracts. The change in title of the *Journal of Philosophy, Psychology, and Scientific Methods* has apparently not affected the character of its contents; for equal prominence is given to psychology and philosophy, despite the

curtailment in name, eliminating "Psychology and Scientific Methods." The editorial management of three psychological periodicals has been re-organized, Prof. Titchener taking charge of the *American Journal of Psychology*, Prof. Rugg of the *Journal of Educational Psychology*, and Dr. Porter of the *Journal of Applied Psychology*.

The discussions in theoretical psychology, for the most part, centre about behaviorism, and many laborious efforts are expended by the younger psychologists on explaining conscious experiences in terms of stimulus and response. Attempts to combine psycho-analysis with behaviorism seem to be plentiful, and one might observe in general a tendency in some of the recent works to dovetail two apparently conflicting points of view. On the experimental side, the variety of investigations is amazing. Specialization is very noticeable. A man working, for instance, on brightness effects will rarely take up anything else.

A hopeful sign of the times is the great attention which social psychology is beginning to receive in this country. Probably no branch of psychology has been so deplorably neglected, amidst the splendid opportunities for observation along those lines, as group psychology. Lately, however, the lacuna has been partially filled by sociologists. And now the psychologists are beginning to recognize the value of collective problems in the light of their science. It is interesting to note in this connection that the *Journal of Abnormal Psychology* is shortly to include in its programme a social psychology section which will, in all likelihood, develop into a Journal of Social Psychology. Among the most important works of the year are two volumes in social psychology—the one by Prof. McDougall entitled *Is America Safe for Democracy?*; the other, a production of unusual breadth and scholarship, by Prof. Williams, called *The Foundation of Social Science*.

A further gratifying phenomenon is the advertence to the historical background of psychology which is manifesting itself in America. It may be merely a chance happening that the same year should see the completion of Prof. Brett's comprehensive work, *A History of Psychology*, and Prof. Warren's *History of Association-Psychology*, yet one can readily anticipate that Germany will no longer retain her monopoly on historical research. Brett's history, let it be said, may be claimed as a British work, not only because it was published in England, but also because its reflects the British point of view.

The organization of the New York Association of Consulting Psychologists and the proposed formation of a large corporation with similar aims, to be directed by prominent members of the

American Psychological Association, seem to have been actuated by the desire to protect the American public from the charlatanry which is so rampant here in the guise of psychology.

What appears to be the bulkiest psychological report ever published is the fifteenth volume of the *Memoirs of the National Academy of Sciences*, entitled *Psychological Examining in the United States Army*. It contains about 900 pages in quarto size. When we consider that the Psychological Examining Committee was only one of a dozen or more psychological committees engaged in war work of various kinds, we can imagine to what extent psychology has been exploited in the service of the United States Army.

The appointment of Prof. Angell, Dr. Farrand, and Prof. Scott to the presidencies respectively of Yale, Cornell and North-Western University is an indication that psychology is becoming more and more a field to be reckoned with in the administrative world; and will probably lead to the expansion of the science so as to become a force in the community and not merely a subject on the college curriculum.

The death of Prof. George Trumbull Ladd removes from our midst a pioneer in the field of psychology, his *Elements of Physiological Psychology* affording many a teacher, including William James, a scientific guide-post in a labyrinth of speculation.

A. A. Roback.

THE DEVELOPMENT OF PSYCHOLOGY IN ITALY.

It may be said that psychological studies in Italy began from the time when the works of Locke, Berkeley, Condillac, and the Scottish School became known there. The problem of the origin of ideas gave place to many publications strongly marked with a psychological character, as *Idealogia*, by M. Gioia (1767-1828), and the *Genealogy of Thought*, by P. Borrelli (1782-1859). With the increasing influence of the French sensationalists, psychology has been more and more cultivated, but the line of inquiry was one-sided and limited to studies of sensibility, so that finally physiology was cultivated, instead of psychology. This predominance of physiology and materialism was hindered by the great influence of the Scottish school which had the merit of developing the psychological side. It may be said that P. Galluppi (1770-1846) was the first modern psychologist in Italy. He tried to combat the physiological bias, and one of his first works was a strong refutation of the physiological point of view. His gnoseological works are also marked with a

psychological character. Although influenced by Locke, Galluppi drew from this philosopher very different conclusions from those at which the French sensationalists arrived, because he accentuated and developed the subjective and volitional aspects of mind. The great Italian philosopher, A. Rosmini (1796-1855) also merits consideration as a founder of psychology in Italy, but he inclined chiefly to metaphysical and gnoseological studies. After Rosmini there was a period of stagnation in the development of Italian psychology, because of the great development of pure speculative metaphysics. Psychology was neglected almost until our own time. We must pass to F. Bonatelli (1830-1911) in order to find an eminent psychologist of Italian race. Two opposite and hostile currents had been acting till his time: on the one hand, the obstinate idealism refractory to any experience, which denied the real existence of matter; on the other hand, the sensationalism that denied the existence of mind. Bonatelli, judiciously compromising, reconciled in the immediate and primitive intuition of self the antithesis of subject and object, form and content, thinking and thought, and the secular distinction between reality and idea. His chief book was *Consciousness*, and in this book he laid the foundations of certitude, the criterions of reality and objectiveness. He may be called the father of modern psychology in Italy, because he was the first to treat psychological questions by analytical and scientific methods; he was the first to introduce empirical psychology and the analysis and precise observation of mental facts into Italy. He has the great merit of having turned his attention to single questions, and there is no mental act or state on which this incomparable analyst did not direct his exploring gaze. He made deep and efficacious studies on the general nature of consciousness, on its properties and characteristic forms, on the so-called mechanism of representations, on illusions of memory, on perception, on association, and on will.

In the second half of the last century the naturalistic line of inquiry was also prevalent in psychology, and under the influence of foreign culture experimental psychology began. But at first the greatest contributions were made by psychiatrists and physiologists, and the means of the study and experience were furnished by physiological laboratories and psycho-pathological clinics. The great physiologist, A. Mosso (1846-1910) initiated the investigation of the relations between circulation and mental processes, both as regards the choice of the problem and the technique of the research. He demonstrated the small increase in the frequency and energy of cardiac systole which accom-

panies mental processes and emotions; he discovered the diminution of volume in the forearm and other peripherical regions, the more abundant flow of blood to the brain, and the increase of general blood pressure—all fundamental researches, on which depend many others, so that together they form one of the most valuable and remarkable achievements of modern psychology and anthropology. Not less important are his studies on the respiratory expressions of mental processes, on the connections between muscular and intellectual work (by means of the ergograph invented by himself), on brain temperature, fatigue, and his fine and penetrating analysis of the emotion of fear, especially in its somatic aspect. The very important works of other great Italian physiologists, Luciani, Tamburini, and Leppilli, on brain physiology, cerebral localisation, genesis of hallucinations, physiopathology of language, etc., were a great contribution to the study of mental in relation to physiological processes. To Tamburini is due the great credit of having created in the asylum of Reggio Emilia a real Institute of Psychiatry, where the most distinguished alienists now directing the asylums and clinics of Italy received their psychopathological and psychological training. This institute became a centre of psychological studies, and here were performed the first researches in experimental psychology, among which the most important were those of Buccola on the reaction-time and duration of elementary and complex psychical acts, interrupted by his premature death. His principal work, *The Law of Time in the Phenomena of Thought* (1883) still remains a classical essay in psychometry. The researches of the Reggio Emilia school have been published in the "Rivista sperimentale di Freniabria," which has already completed forty-five years of life. Contemporarily with this development of psychological studies in Reggio Emilia, the great Italian anthropologist, G. Sergi, founded in Rome the first laboratory of experimental psychology attached to the Institute of Anthropology (1889). From the physiological institutes of Mosso and Luciani, from the psycho-pathological institutes of Tamburini, Morselli (who made a notable contribution to the study of suggestion, hypnotism and spiritism), and Sergi, went out a number of bold investigators of psycho-physiology, psycho-pathology and experimental psychology; Kiesow, Patrizi, De Sanctis, Ferrari, Treves, and others. This physiological and pathological direction of psychological work encountered a strong and effective opposition in F. De Sarlo, at one time a psychiatrist, physiologist and investigator at the Reggio Emilia Institute, who afterwards turned to philosophical studies, of which he is now one of the chief Italian

masters. He founded in Florence, in 1903-1904, the first laboratory of experimental psychology, in close connection with the philosophical faculty, and with a purely psychological orientation. Through this institution he wished to establish the position of psychology as an atonomous science, and its right to be pursued by psychologists, and not to be considered any more as a mere branch of physiology. Although he accepted all the methods of objective observation and experimental research, he wished to deepen and improve these by constant reference to the data of introspection, which he held ought to be considered the true basis of psychological inquiry. This opposition has been very effective not only because his laboratory produced capable investigators in experimental psychology (Aliotta, Bonaventura), but also because it had an influence on the current of thought which he opposed, provoking in it a deepening of methods upon the basis of introspection. (We hope shortly to give an abstract of the very important recent publication by De Sarlo: *Psicologia e filosopia*). A great and valuable contribution to the psychological advance in Italy has been given by G. C. Ferrari, who since 1905 has edited the *Rivista di Psicologia*, which until 1920 was the only psychological review in Italy. In 1920 began the publication of the periodical, *Archivio Italiano di Psicologia*, under the direction of F. Kiesow and A. Gemelli. From 1912 till 1914 was issued the review *Psyche*, edited by R. Assagioli, who made interesting studies on the unconscious, psycho-analysis, the psychology of animals and psychotheraphy.

H. HELLER-HEINZELMANN.

PSYCHOLOGY IN BELGIUM.

General circumstances have never been very favourable for philsosphical sciences in Belgium, and since the end of the war they are less so than ever. As in all other Roman Catholic countries philosophy has not yet become popular here. Then since the small nation of seven millions is composed of two races with different languages—French and Flemish—the accessible reading public is so small that in view of the increased cost of printing a psychologist can hardly find a publisher willing to run the risk of putting a new book on the market.

Since the armistice, Miss Dr. Ioteyko, the creator of the independent Paidological Faculty, has accepted a chair at the University of Warsaw, her native place, with the consequence that her promising institute has not re-opened its doors, and that the *Revue Psychologique*, which was also her own undertaking, has not made its re-appearance. The *Revue de Pédotechnie*,

created in 1913, on the initiative of Prof. De Croly, of Brussels, has not survived the war on account of financial difficulties. As from our special point of view these were the two only theoretical reviews we possessed here, it is clear that we are rather badly off at present. Prof. Dwelshauwers, who is a well-known psychologist, has lost his chair at the University of Brussels on account of his Germanophile views, but his departure is nevertheless a loss for our national science.

But in spite of all these deplorable circumstances, there are none the less some encouraging signs. The University of Brussels organised last year a sort of unofficial pedagogical faculty under the leadership of Prof. De Croly, who is the originator of a "new school" system highly appreciated on the Continent, and which I hope shortly to expound to the readers of Psyche. The new institution is meeting with much success.

Then there is to be mentioned the creation in Antwerp of a Flemish University for girls only, by the Roman Catholic feministic organisations. It has given an important place to psychology, both general and in its applications to education, religion, sociology, and æsthetics. This is probably due to its rector, the Reverend Father Jansens, who is himself a distinguished scholar in mental philosophy.

Next there is a big movement being prepared in connection with employment psychology. The Compulsory Education Bill, which was only voted in 1914, has just been extended to the fourteenth instead of the twelfth year. The institution of the eight-hours day (whereas before work was protracted in some trades as long as twelve and even fourteen hours) has created a strong need for higher productivity of labour. Finally, the unfavourable situation of Belgium on the money-market has rendered the position of Belgian manufacturers extremely difficult. It is indeed based almost exclusively upon the transformation and export of imported raw materials. These various circumstances have combined to create an unusual interest in industrial psychology, from which much help is expected. No wonder that the question of vocational and employment psychology is the order of the day in our daily papers and in governmental circles. It is undoubtedly due to this impulse that the laboratories of experimental psychology in the Universities of Brussels and Ghent (the latter under the direction of Professor van Biervliet) are almost exclusively at work on this problem, and count an unusual number of students who follow their courses. The town corporations of Brussels and its suburbs, who always take the lead in educational questions, have recently created, perhaps somewhat prematurely, an inter-

communal laboratory with the object of orienting their pupils in the different trades and professions, and there are even signs that this initiative will be followed by and by throughout the country.

J. VARENDONCK.

PSYCHOLOGY IN FRANCE.

INSTITUT DE PSYCHOLOGIE, PARIS.—Lectures will be delivered throughout this year (December, 1921—July, 1922) on the following subjects:—

General Psychology.—Pfr. Delacroix: The Hypothesis of Subconsciousness.

Pathological and Experimental Psychology.—Pfr. G. Dumas: The General Directions of Psychology—Practical Work and Demonstrations at Ste. Anne Asylum.

Experimental and Comparative Psychology.—Pfr. Pierre Janet: The Psychological Evolution of some Modes of Religious Behaviour.

Physiological Psychology.—Mr. Piéron, Director of the Laboratoire de Psychologie Physiologique: Vision—Practical Work on; Perceptions, Motricity, Emotion, Mental Efficiency.

Zoological Psychology.—Mr. E. Rabaud, Professor of Embryology: Recent Researches on Tropisms: A General Study of Instinct—Practical Work and Demonstrations.

Educational Department.—Dr. Wallon: Psychology Applied to Education (Internal Secretions, Nervous System, the Time of Growth, the Child's Perceptions and Knowledge, its Representation of Objects).

Dr. Simon: Experimental Education (from a Traditional to an Experimental Education)—Practical Work in the Laboratory of A. Binet.

Department of Applied Psychology.—(Application to Work and Industry; Professional Selection and Orientation).

M. Piéron: Measurement in Psychology; The Method of Tests; The Calculation of Correlations, etc.

Practical Work by M. Lahy: Technique of Physiological Psychology Applied to the Determination of Aptitudes. Graphical and Cinematographical Study of the Professional Gestures. The Symptoms of Fatigue.

In addition to the abstracts of purely psychological periodicals which will be found in our Review Section, the following notes are of interest:—

Sociology.—E. Durkheim: *La Famille Conjugale*[1] (Revue de Philisophie, Jan., 1921).—The author gives this name of "the conjugal family" to the group formed by the father, the mother, and their minor or unmarried children who are living with them. It is the last and highest form of the family organisation, and is characterised by the nearly total disappearance of the old family communism and by the individualisation of its members. This evolution must be achieved by the disappearance of the right of inheritance, which is nothing but the prolongation of the family communism under the régime of private property, and introduces artificial differences between the individuals. The stimulus to our personal efforts will then be the professional consciousness, as it is already in the élite. The progress of the family is also marked by the growing intervention of the State in its private life and relationships. When we see that the power of the family over its individual members declines, we see on the contrary that marriage strengthens and tends to be the exclusive condition of parenthood.

M. Fauconnet: *La Responsabilité.*

Responsibility is not an intuitive notion which could be studied only by introspection; there are objective data, which are the judgments of responsibility delivered in various societies. The subjects considered responsible in our society will be judged irresponsible in another; *e.g.*, the insane, animals, inanimate objects such as stone, wood, and collective entities such as the family are considered responsible in primitive societies. The commonly accepted theory that there is responsibility when there is causality is a tautology: for there must be causality when there is responsibility, a being which we do not think responsible, such as an animal, a stone, cannot be the *cause* of the crime or offence. The point is that the notion of responsibility would be meaningless if first of all we did not want to punish; the rôle of the sanction is to strengthen the social beliefs violated by the criminal action. If it were possible it would be applied to the crime itself in order to do away with it; but since this is impossible it is applied to the symbol of the past crime: to the being which had a share in it. The rôle of responsibility is to make possible the realisation of the penalty by furnishing a being

[1] This is the last of a series of lectures on the Family which were given in 1892 at Bordeaux University, and were never published.

to which it will be applied. Thus responsibility is an institution of social safeguard. Society is first inclined to consider itself responsible as a whole, then the localisation of responsibility upon one single being delivers society; this localisation may even become an institution, as in societies where a human or animal victim is sacrificed yearly as a sin-offering. This theory, which considers in penalty and responsibility only their social usefulness, might be thought immoral, but the author adds: Sanction being the condition of the existence of a morality, therefore sanction and responsibility take their moral value from the value of that morality.

Education.—E. Claparède. *L'Ecole sur Mesure.* Hitherto the teaching at school is directed to an average and unreal pupil. But children have very different aptitudes, and in order that the teaching at school be more fitted than it is now to the individuality of each child, the author proposes that half of the courses should be compulsory, the other half optional.

NOTES FROM AUSTRIA AND GERMANY.

The Society of Medicine and Natural Science of Dresden held a discussion on the Psychology of Spiritism and Telepathy. A closer scientific enquiry was unanimously thought to be necessary, though some of the debaters were convinced of the truth, others of the falsity of the facts alleged.

Society of Applied Psychology and Psychopathology of Vienna.—Dr. Prinzhorn, of Heidelberg, read a paper on the art of the insane, comparing it with the primitive and children's art and modern expressionism. A symposium was held on the Biological Value of Psychopathological Elements in Culture, with an introductory paper by Prof. Strausky.

Professor Constandin T. Oesterreich, of Tübingen University, known by his books on Self and on Religious Psychology, and by his revision of Vol. IV. of the Neberweg-Heinze History of Philosophy, has published a book on *Parapsychology*, by which term he designates all phenomena of occultism, mediumship, telepathy, etc. He holds them to be true manifestations of powers as yet unknown. Dr. Kolb, director of an asylum for the insane, criticised Oesterreich's work and similar publications somewhat acrimoniously in the Münchener Medizinischen Wochenschrift, whereupon some discussion arose, which did not, however, contribute anything materially new.

Anthroposophy is the name given by Dr. Rudolf Steiner to an occult science inaugurated by him which seems to have a great number of adherents. The sect has its own temple or school at Donach. They not only speculate on occult and metaphysical matters, but intend to reform the social organism and to teach new theories of medicine and therapeutics. Steiner was known through some studies on Goethe and work in the philosophy of liberty. His new teachings derive from the old theosophical theory and seek to combine it with the views of German mystics. He lays stress on acquiring a higher knowledge by personal experience; his descriptions are only rightly understood if one has such experience. Though it is quite clear that some of Steiner's teachings are very fantastic, the number of his admirers seems to increase; the true and earnest ethical pathos pervading his writings certainly contributes much to this effect.

Professor G. E. Müller, the well-known psychologist of the University of Gœttingen, has resigned. Prof. W. Koehler, of Berlin, is to be his successor.

SURVEY OF CURRENT LITERATURE

[*As previously announced, we have made special arrangements, in response to numerous suggestions, whereby any books recommended or mentioned in our pages, as well as other psychological works, can be obtained with the least possible inconvenience and delay from* The Cambridge Magazine Bookshops (Psychological Dept.), 6, Kings Parade, Cambridge. *The proprietors have kindly consented to a scheme whereby readers of* Psyche *need not forward a remittance with every order, a system which is calculated to save much correspondence and annoyance at a time when, through abnormal trade conditions, books are so constantly out of print or rebinding.*—ED. *Psyche.*]

Morbid Fears and Compulsions. By H. W. FRINK, M.D. With an Introduction by James J. Putnam, M.D. (Kegan Paul, 21/-.)

This book consists of a general exposition of Freudian doctrines, together with detailed accounts of two particular cases—one of compulsion neurosis and one of anxiety hysteria.

We agree with Dr. Putnam when he says, in his introduction, that "there will be room, and welcome, during many years to come, for any book that deals consciously and clearly with the problems here involved." Furthermore, Dr. Frink's exposition appears to us to be in many respects markedly superior to the usual run of psycho-analytic literature. It conveys the impression of having been written by a man possessed of a wide psychological knowledge and a correct psychological and biological perspective. This is a pleasant change from the too common alternative of a writer who may have studied psycho-analysis thoroughly, but is insufficiently versed in general psychology to present his special doctrines as parts of a coherent whole.

In particular we may refer to Dr. Frink's careful explanation of the meaning to be attached to the Freudian term 'sexual'; to his emphasis on the fact that all instincts and tendencies arise from the primary instincts of self-preservation and race-preservation; to his treatment of emotions and morbid fear, and to the recognition of the fact that the conscious, the fore-conscious, and the unconscious are not really discontinuous. Another good example is this: "If we had impulses which throughout the whole life of the individual were so consistently and unremittingly warped, cramped, and deformed in every conceivable and unnatural manner . . . *then* we might have neuroses in which they and not the sex factor played the dominant rôle."

On the other hand, the very important subject of The Theory and Mechanism of Psycho-analytic Cure (Chapter X) is disappointingly treated. A more satisfying account could have been given by shewing how neurotic symptoms often constitute a compromise

formation whose value is automatically destroyed by exhibition of its *raison-d'être*, and thence arguing to the more general cases where less specific symptoms are involved. Nor can any account of psycho-analytic theory be considered complete without a thorough investigation of the influence of the physician in the light of modern knowledge of what is involved in the process of suggestion.

The book can be recommended to those who want a sound, conscientious, and exceedingly lucid account of Freudian doctrines.

Psychanalysis in the Class-room. By GEORGE H. GREEN. (University of London Press, 7/6.)

Few needs of to-day are greater than education, and there can be no greater aid to the teacher than a proper understanding of the minds he has to train. But he can seldom afford the time to make an exhaustive first-hand study of modern psychological thought, and it is therefore very suitable that writers like Mr. Green—who laid sound foundations under the auspices of Professor McDougall—should write a book of this kind for his benefit. Mr. Green writes clearly and sanely; he does not profess, we think, to make new contributions to theory or technique, but explains accredited views with lucidity and moderation.

Reincarnation: True Chronicles of the Re-birth of Two Affinities. Recorded by one of them. (Cecil Palmer, 10/6.)

"This . . . book . . . is sure to give the reader the key to many of the mysteries of life." (Wrapper.) It is also romantic.

Divorce: To-day and To-morrow. By C. GASCOIGNE HARTLEY. (Leonard Parsons, 6/-.)

To secure the good consequences of right marriage and to avoid the evil results of bad ones is the most urgent problem of the modern state. Any book on divorce which may assist to form sound public opinion is therefore to be welcomed.

To this category Mrs. Hartley's work unquestionably belongs. Starting with three introductory chapters on the history of divorce, she proceeds to a summarisation of foreign divorce laws (it is perhaps unfortunate that she has not told us of the customs of non-European civilisations, such as China), and thence, *via* certain illustrative examples, to Discussions in Parliament and The Cost of Divorce to the Poor. In her Attempt to Answer the Christian Objections to Divorce, the author seems to us to have much the best of the argument and to clear the ground effectively for her final constructive chapter. That she is guided by the right principles is sufficiently evidenced, we think, by the following quotations:—

(i) The marriage is broken before the divorce decree is applied for.

(ii) If there are no children to be considered when the marriage tie is severed the main consideration is that each of the partners should behave honourably to the other.

(iii) If there are children . . . the main consideration is that each of the partners should behave honourably to the child or children.

(iv) In every case the welfare of the child . . . should be taken as the standard to which the desire of the parents must be subordinate.

These embody the right scale of values, and such a code is immeasurably superior to any dogmatic misinterpretations of

Biblical texts. With views built on this foundation we have nothing but sympathy, even although we may differ on minor points of policy. We hope the book will be widely read.

The Gate of Remembrance. By F. BLIGH BOND, F.R.I.B.A., (Blackwell, 7/6.)

This new edition of Mr. Bligh Bond's well-known book is welcome. The story of the automatic writing which led to the discovery of the Edgar and Loretto Chapels at Glastonbury is a classic of first-rate importance to psychical-researchers and also to such psychologists as condescend to learn about such things. It is one of the few cases which is not only above suspicion, but which has also been properly recorded and has led to definite tangible results of an unexpected nature. Such of our readers as do not know the book would be well advised to order it.

Taboo and Genetics. By M. M. KNIGHT, Ph.D., I. L. PETERS, Ph.D., and PHYLLIS BLANCHARD, Ph.D. (Kegan Paul, 10/6.)

Whatever else may be said about this book, there is little doubt that to the majority of non-technical but intelligent readers it will prove intensely interesting.

No single reviewer can hope to deal adequately with it, however, for in order to do so he would have to be well versed in the latest work on biology, sociology, anthropology, and psychology.

The first part deals with the biology of sex: inheritance by chromosomes, sex in terms of internal secretions, sex as quantitative, intersexes, sex specialisation and adaptation, etc.; this is probably the most interesting and informative section for the general reader. The second part discusses The Institutionalized Sex Taboo, and argues the dysgenic influence of the Taboo. The third part is psychological; most of it is on standard lines, but a sound and relatively original line is taken in urging that the standards of social esteem must be reorganised on a eugenic basis.

The book is well worthy the attention of the general reader, although the authors are somewhat indiscriminate in their choice of "authorities." The split infinitives are innumerable.

National Welfare and National Decay. By WILLIAM MCDOUGALL, F.R.S. (Methuen, 6/-.)

The supreme importance of the subject with which Professor McDougall deals would alone suffice to make his book of more than common interest, even if it were not so clear and readable as it is.

His thesis is that most civilised nations are at present breeding their new generations chiefly from the inferior grades of their existing stocks, and that if this process is not speedily arrested and reversed the nations in question will soon deteriorate and become virtually extinct.

This prospect is so terrible and the evidence in favour of Professor McDougall's views is so strong that the subject merits the most careful consideration.

The main stages of the argument are: (i) Mental and moral characters are important to the race; (ii) they are transmissible by heredity; (iii) it can be shown experimentally that valuable transmissible characters predominate (*a*) in certain races, (*b*) in certain

(socially superior) grades of any given race; (iv) the birth rate is much higher in the socially inferior than in the socially superior grades of most civilised races; and, therefore, (v) the new generations of these races are unlikely to inherit as large a share of desirable characters as their predecessors, whence (vi) every effort should be made to breed succeeding generations as much as possible from socially superior grades.

With the first, second, and fourth of these no sane person will disagree; the possibility of doubt enters in the third. Even here we must make certain reservations before attempting to criticise. In the first place, there can be no doubt whatever that the whole argument is unimpeachable so far as the dregs of humanity are concerned. Idiots, imbeciles, criminal lunatics, obvious mental defectives and syphilitics unquestionably not only transmit their disabilities to their children, but are also extraordinarily prolific. In the second place, we may concede that the intelligence tests on which Dr. McDougall relies to a considerable extent do measure, in the individual to whom they are applied, mental characters which are valuable to the race. Nor need we deny that parents who are found to be, in this sense, "intelligent" are likely to have children who will show up equally well under test.

The question is rather whether such tests, however skilfully devised, really demonstrate and measure qualities which are truly innate and independent of environmental influences (hygiene, nutrition, etc.), and whether, if they do, there may not be other qualities, of equal racial value, which may be actually or potentially present in those who make a bad performance in the tests selected as criteria.

Opinions will doubtless vary, but it is at least interesting to note that so responsible an authority as Mr. Frank Watts, summarising the present position of Intelligence Tests (1921), says:

"(i) The idea that innate capacity could be measured apart from the influences of education and training has proved barren.

"(ii) The attempt to construct a single reliable test capable of measuring general intelligence has been given up as impossible."

The second question, as to whether tests may not overlook qualities as valuable as those they demonstrate, is more difficult, but it seems very probable that children possessing, for example, valuable æsthetic aptitudes might make a very poor showing under test.

By advancing these considerations we do not mean to suggest that heredity is of negligible importance, or that intelligence tests are valueless, but rather that the problem of environment is more urgent, at the present time, than that of heredity, and that the conclusion that the socially superior grades are very much more desirable as parents than are the socially inferior is not of sufficient cogency to justify its being pressed in the face of the opposition which it cannot fail to arouse in this democratic age.

None the less, we believe that Dr. McDougall's contentions are in the main correct: intelligence tests probably do, on the whole, indicate the more desirable individuals from the racial point of view; and these would probably, on the whole, be more numerous in the socially superior grades, even if environmental conditions were levelled up. But the latter constitute the most urgent

problem, and inasmuch as most of our social ills proceed from over-population, we regret that Dr. McDougall does not extend a less qualified approval to the Birth-Control movement, which, universally applied, would be of inestimable benefit to mankind.

In spite of these criticisms, the book is full of interesting matter, and should be read by all who take an interest in the welfare of the race.

The Analysis of Mind. By BERTRAND RUSSELL, F.R.S., late Professor of Philosophy at Pekin University. (Allen and Unwin, 1921, 16/-.)

Logic. Part I. By W. E. JOHNSON, M.A., Fellow of King's College, Cambridge. (Cambridge University Press, 1921, 16/-.)

The growing importance of Psychology is well shown by the appearance of these two books by two of the foremost living logicians. Mr. Russell's covers most of the psychological topics which have been discussed during the present century, with only occasional reference to logic, while the extent to which Mr. Johnson departs from traditional treatment may be seen by a comparison with any standard logical treatise.

As readers of recent numbers of *Mind* are aware, Mr. Russell has been led of late to devote serious attention to the work of the behaviourists in its bearing upon Meaning. Thinking, he sees, can no longer be regarded as a mysterious and undiscussable phenomenon, unique in kind. It is a form of behaviour or adjustment like walking or eating; and the result is a causal account of thought-processes on a biological foundation. So unexpected a conversion should be beneficial in many quarters, for though the standpoint is not new to psychology the attempt at precise formulation has seldom been made. On the other hand, it must be admitted that the texture of the argument is below Mr. Russell's usual standard, and ambiguities and evasions are not infrequent.

We may instance his discussion of the *act*, which is rejected on p. 18 and virtually reappears as necessary for an account of *memory* on p. 21; the foot-note on p. 50, which makes a grave objection to his own definition of *instinctive movement*; the acceptance of Watson's erroneous *frequency theory* for learning (p. 52); the fading of the *smell* of the fish from the argument (p. 54); the *discomfort* which on p. 71 he defines in causal terms is not the same property which he has distinguished from pain on p. 70; the conflict between the *conscious desire* on p. 73 and the definition given on p. 72 will, when recognised, involve the re-writing of many pages, since desire, as desire + true belief as to its purpose, is not the conscious desire which we all commonly oppose to unconscious. And so on.

Particularly interesting are the difficulties raised by Mr. Russell's previous physical theories (recapitulated pp. 93-107, where 'happenings' replace sensibilia) in relation to the tentative acceptance of engrams (p. 92). It is difficult to believe that modifications of physiological structure are merely the sets of 'their' aspects.

Chapters IX–XIV, pp. 157–279, are occupied with the analysis of knowledge, and form the most valuable portion of the book. Few psychologists can complete its perusal without gaining a new

conception of their science. Most striking is the attempt to construct a causal theory of Meaning. "Sometimes an image or word as stimulus has the same effect as would belong to some object. In that case we say that the image or word means that object" (p. 209). This definition in terms of causal efficacy covers too narrow a field, and Mr. Russell sometimes supplements it with resemblance. He would probably do better to replace causal efficacy by causal origin, making an opposite use of mnemic causation whereby the meaning of a stimulus would become the completing term, if any, of the context which includes the stimulus as sign and its mnemic antecedents. In this way he would avoid the 'duality' (p. 271) of objective reference, and the appalling complexities with regard to truth and falsehood which he is driven to admit.

If Mr. Russell fails explicitly to relate his psychology to the logical views for which he is famous, Mr. Johnson's painstaking work by no means provides an alternative solution. He defines Logic as "the analysis and criticism of thought," and adopts as a general view "that no logical treatment is finally sound which does not take account of the mental attitude in thought." He further holds that "logic formulates standards or imperatives which as such have no significance except as imposed upon mental acts." Yet, in spite of this step in the right direction, which every psychologist must welcome when made by a formal logician of the old school, the reader will be surprised to find such entities as 'the reason,' 'the content of an idea,' 'notions,' and so forth appearing haphazard amongst the 'universals,' 'particulars,' 'relations,' 'facts,' and the rest of the more usual machinery. Mr. Johnson, moreover, has a habit of re-christening ancient difficulties as though this process affords a solution. Thus, on p. 11, "the distinction and connexion between substantive and adjective correspond to—and, on my view, explain—the distinction and connection between particular and universal," and similarly for the familiar antithesis 'subjective' and 'objective,' "it is better to substitute the antithesis *epistemic* and *constitutive*. . . . As for the term constitutive, it has the force of 'objective'."

Although much is said about the fundamental term 'proposition,' what it stands for nowhere clearly emerges. It is *par excellence* the unit of thought (p. 9); it characterises some fact (p. 14), and also is in accordance with a certain fact if true (p. 16); it is an object of belief (p. 4); and then, again, "it is not, so to speak, a self-subsistent entity, but only a factor in a concrete act of judgment" (p. 3). Such obscurity in a work which both claims and requires a special clarity necessarily vitiates all but the most obviously formal elaborations. Those, however, who are familiar with Dr. Keynes' handbook will recognise marked advances in this somewhat arid field. Chapters III and IX may be instanced.

It is to be hoped that we shall hear more in later volumes of the doctrine of the Determinable which appears in Chapter XI. This, which is Mr. Johnson's most original contribution, deals with the synthetic compatibility of adjectives. A given surface may be either red or green, but not both; light or dark, but not both; vivid or dull, but not both. Thus colour is in Mr. Johnson's terminology a single though complex determinable, precise hues, brightnesses, and saturations being determinate adjectives under this determinable

(p. 183). In a similar way sound is a determinable, under which as super-determinates are tone, pitch, and intensity. Further, the same kind of analysis can be applied to all kinds of adjectives, quantitative and qualitative alike. The applications of this in psychology are evident. What is the form, for instance, of the complex determinables 'mental,' 'feeling tone,' 'attitude,' and 'belief'? Is 'sensation' a determinable? Regarded from this angle, all problems of psychological analysis and classification can be more systematically treated than hitherto, and Mr. Johnson's further elucidation of the *fundamentum divisionis* will be welcome when it appears. More light on the nature of the adjective is, however, a necessary preliminary.

L'Evolution des Facultés Conscientes. By G. VARENDONCK. (Alcan, 1921, 18frs.)

This interesting and readable book deals in a wide manner with the development and elaboration of consciousness, partly from a biological and partly from a psycho-analytic angle. Dr. Varendonck makes much use of the distinction between merely repetitive revival, for him the most primitive function of retentiveness, and such 'synthetic memory' (the term, as is well known, is better retained for other purposes) as is involved in perception and in mnemic causation generally. Upon both he brings together a wealth of interesting and often amusing instances and illustrations. It cannot, however, be said that he succeeds always in making his points clear, and his use of terms such as 'mémoire,' 'intelligence,' and 'conscience' is open to criticism. Particularly is this so when he comes in his final chapter to discuss the relations of 'la conscience,' 'l'intelligence,' and 'la faculté de se rendre compte des phénomènes,' *i.e.*, awareness. All these have in his treatment too many aspects, and are too much aspects of one another for a clear result to emerge. But in spite of such defects in the theoretical development of his subject, the author has produced a book which, like his earlier *Psychology of Daydreams*, is decidedly worth reading, if only for the many finely-recorded observations of psychical processes of all kinds which are introduced in the course of the argument.

Industrial Fatigue and Efficiency. By H. M. VERNON, M.A., M.D. (Kegan Paul, 1921, 12/6 net.)

Since the British Association Committee's report of 1915 there have been numerous additions to the literature of Fatigue, but it is doubtful whether, with the possible exception of the statistical researches of Dr. Florence in America, anything worth speaking of has been added to our knowledge. Moses himself was presumably aware that when fatigued we do less, or worse, work, and that a good deal of unnecessary as well as necessary work is carried on under conditions which do not make for efficiency. Certainly Miss Josephine Goldmark can have learnt little from her imitators and successors, and even from her bulky treatise the chief lessons to be derived were those of common sense.

Of the many general surveys now available, that of Dr. Vernon is far the most useful and informative. As one of the Investigators

for the Industrial Fatigue Research Board, he has had access to material of special interest, both during the war and since; and he is also familiar with much of the latest American literature. A volume such as this, on a subject which raises so many important psychological problems, is particularly valuable to those who are disinclined to familiarise themselves with industrial conditions at first hand. The author does not raise issues sufficiently fundamental to render his work either difficult or disquieting, and his curious conclusion that "every boy ought, during his school days, to devote a portion of his time to the study of some branch of natural science, such as chemistry or physics," in order to "acquire a scientific habit of mind," will probably find more support amongst psychologists than his remark that "it is possible to say definitely in many cases whether women ought, or ought not, to continue working in an occupation now there is no longer a shortage of male labour."

A Project Curriculum. By MARGARET ELIZABETH WELLS. (Lippincot, 8/6.)

Seven Ages of Childhood. By ELLA LYMAN CABOT. (Kegan Paul, 12/6.)

Twentieth-century America, inspired by the activities of James and Dewey, has been prolific in educational studies of merit, and these two books are both of value to teachers in search of psychological suggestions. The 'Project' in question was worked out in Trenton, N.J., and though there is nothing very new in using the experiences (in this case a Fair) and social relations of everyday life as a setting and a stimulus for school work, the particular applications are here set forth in unusual detail and supported by an elaborate treatment of Play "as essential for the maximal development of the child, a fact to be definitely recognised in the organisation of a curriculum." One may suggest, however, to writers of volumes on these topics, that it would prejudice readers in favour of their enthusiasms if it were more obvious that 'Projects,' in addition to producing poems such as that cited in the Appendix (p. 323)—

"Buy, buy Thrift Stamps,
Buy, buy, Bill;
And Uncle Sam's soldiers
Will the Kaiser kill"

—are capable of engendering a certain respect for the laws of Euphony. "The Outcomes of Curriculums" is hardly a happy chapter-heading, but it is quite in keeping with the jargon in which the Project is introduced. Here the author of **Seven Ages of Childhood** has a distinct advantage, and her knowledge of the extensive literature of child-psychology is skilfully utilised for the public benefit. Of the Seven ages distinguished, the Dependent Age lasts till the beginning of the fourth year, the Dramatic Age ends with the seventh year, the Angular with the eleventh; the Paradoxical Age is passed at 14, the Age of the Gang at 16; from 15–18 we have the Age of Romance, and from 16–21 the Age of Problems. In an interesting table we have the alternative divisions of Lee, Fiske, Puffer, Johnson, King, and Tyler—and nearly all the divergencies from these writers seem fully justified.

Bergson and Future Philosophy. By GEORGE ROSTREVOR. (Macmillan, 7/6 net.)

Mr. Rostrevor writes from the point of view of one who, "while accepting the Bergsonian doctrine of the reality of time, combats the theory that this reality is apprehended by a *non-intellectual* intuitive faculty" (p. 110). In Bergson's later writing, he contends, the contrast comes to be drawn "no longer between intuition and analysis as *functions* of the intellect, but between intuition and intelligence as *faculties* of the mind," whereas intuition might be defined (p. 13) "as standing simply for direct intellectual apprehension of an object set over against the mind."

Unfortunately, it is no longer possible to carry on what is primarily a psychological discussion in such vague language with much profit. Intuition (contrasted with analysis inside intelligence, which is "a development out of instinctive action") is for Mr. Rostrevor "the direct apprehension of an object, which is always *more or less abstract*" (p. 88). The italics are ours; and, again, "Any knowledge of a relation is already, in essence, intellectual" (p. 177). At such a level it is not difficult to range cheerfully over all the so-called problems of philosophy. In so ranging, Mr. Rostrevor succeeds also in saying many informative things about Bergson, and further provides the reader with an interesting reply to what he describes as Mr. Russell's "loose and superficial argument"—from which "it is clear that he altogether fails to understand the very foundation of Bergson's theory of knowledge."

Fijian Society. By the Rev. W. DEANE. Macmillan, 1921, 16/-.)

In the present state of anthropological research most of our material has unavoidably to be collected from the notes of travellers, with no special qualifications for discriminating observation. This haphazard source of our knowledge is the more to be regretted since ethnology, unlike other subjects, must be scientifically explored during the next decade, or the opportunity will for ever have vanished. Such reflections are particularly applicable to the volume before us, since, though the missionary who is responsible for it has collected an unusual amount of miscellaneous information, his attitude, due to religious considerations, makes many interesting records either suspect or incomplete, and colours the whole with the atmosphere of an alien morality.

The Fijians, it appears, are unfortunately immoral—"Until the clothing of the native becomes less scanty we cannot hope for much diminution in this great vice" (p. 148). The psychologist, however, will find useful facts about the motives responsible for cannibalism, and about signs and signals, cursing, and suggestive magic in general—though he would do far better to book a passage to the South Seas and study these vanishing phenomena for himself.

Divine Imagining, an Essay on the First Principles of Philosophy. By DOUGLAS FAWCETT. (Macmillan, 15/-.)

Anyone interested in Psychology who was led by the title of this book to expect that some account of human Imagination would precede the use of Imagining as an all-explaining concept will be disappointed. That to make comforting opinions plausible is the first business of metaphysics is a view which has not in recent times

been openly acknowledged by writers on these subjects. Mr. Fawcett, however, is more frank. "If ultimate reality is such as we supposed it to be in the *World as Imagination*, we can afford to weather all trials with our confidence unabated and unimpaired." The doctrine which has, it is averred, the simplicity of divine things (p. xxiii.) is, since thinking is regarded as "a pale substitute for concrete imagining," nowhere very precisely formulated; the bulk of the book being occupied by expatiations upon its advantages. Those who require assistance in imagining a really desirable universe will no doubt find it of service. For others, whose attitude towards speculation is more critical, this book, advertised on the title-page as "No. 2 of the 'World as Imagination' Series," will appear to have no more concern with truth than a parallel series known as the adventures of Tarzan.

Measure Your Mind. By F. P. STOCKBRIDGE and M. R. TRABUE. (Harrap, 1921, 10/6.)

This work embodies most of the U.S. Army experience in classifying recruits. The tests cover a very wide range, and though no doubt useful on occasion, even in industry, for the most part give results extremely hard to interpret. As may be seen from the chapter on what the tests measure, the authors have not brought to the inquiry more than a vague physiological technique. The subject is, however, one of growing importance, and the suggestions and results here collected may be of service to further investigators. A good deal of ingenuity has gone to the framing of the different tests, and many of them, such as the Mazes (p. 142), would provide excellent after-dinner entertainment for mixed gatherings.

Activism. By H. L. ENO. (Princetown University Press. London, Milford, 1921, 6/6.)

By Activism Mr. Eno means a philosophical hypothesis according to which all forms of being are reduced to "activities," an activity being (pp. 7 and 138) "that by reason of which change exists." An elaborate and cumbrous system is constructed, by the aid of which relations and numbers "exist or subsist on the metaphysic plane." Further, "'psychon' the universal, not otherwise than other universals, has its home on this plane" (p. 140), and the electron (pp. 45 and 89) is held to be composed of 'psychons' not in space or time. Just what critical notes William James did jot down in the margins of the original sketch of this essay it would be interesting to know.

Psycho-analysis and Sociology. By AUREL KOLNAI. Translated by Eden and Cedar Paul. (Allen and Unwin, 7/6.)

Even in the hands of his experienced translators, Kolnai's brochure makes tiresome reading, for whether he is dealing with Durkheim or Janet, with Marx or Lenin, the same awkward phraseology and the same pedantic treatment are in evidence. Those in search of bricks to hurl at psycho-analytic extravagances will find them here in abundance. The author passed through the Hungarian revolution, and this is apparently his revenge as a Liberal-Socialist to whom "the shrewd dialectic of paranoiacs is familiar" (p. 160). But (p. 161) "it would be wrong to look upon Marxism simply as

a case of paranoia" (there may be some sense in it), and even Bolshevism in one of its forms (p. 168) may "really be an anagogic manifestation" (there may be some good in it). Red, however, functions as "the symbol of three different concepts, love, sin, and the revolution. It thus logically corresponds to (*sic*) uniformity, to the all-devouring action of the libido" (p. 172). The ideal of anarchism appears as "confraternal uterine introversion" (p. 118). Everywhere the Œdipus-complex is rampant; and though it is admitted that people often emigrate for economic reasons, we are warned that "the impulse towards emigration may in part arise from an exogamic trend"—a tendency to 'Ahasuerismus' presumably! Even the wooden walls of Old England figure in a desperate effort to get to the bottom of British Hypocrisy: "There is a point of contact between navalism and sexual symbolism; the 'ship' is of the feminine gender" (p. 98). And this is by no means intended only for the marines.

To those who can make allowances for these and similar vagaries the book offers a certain amount of suggestive material, and readers of Durkheim will find in Chapters III and IV an elaborate argument to show that the conclusions of Freud and the French sociologists supplement one another.

Beauty and the Beast. An Essay in Evolutionary Æsthetic. By S. A. McDowall. Pp. 93. (Cambridge University Press, 7/6.)

Mr. McDowall is, in the main, a follower of Croce, and, like his master, is too easily satisfied with high-sounding phrases which will not for a moment withstand critical examination. The book may well be useful in awakening interest in the subject among those who were previously wholly ignorant of it; but it is far too vague and rhetorical to be of any value as a serious contribution to the study of the problems concerned.

PERIODICALS.

Scientia (September, 1921). The only psychological contribution is a critical note by Vernon Lee on "Psycho-Vitalism and the Hypothesis of the Mneme," which discusses Semon's doctrine of the Mneme in its relation to the views on heredity developed by Weissmann, Mendel, Bateson, MacBride, and others. October: E. Lugaro has a paper of some 17 pages on "The Association of Ideas in Dreams." The author admits that the illogicality of dreams may be explained by the absence of sensory impressions, "Pendant la veille les sens nous rappellent sans cesse à la réalité." He also agrees to some extent with Rignano and others in holding that 'affectivity' is much reduced, if not wholly suppressed, in sleep, but contends that although a pure or mechanical process of association may "wander in the realm of the fantastic it may not produce absurdities." He discusses dream-processes, hallucinations, and waking thought at some length, and concludes that "the content of dreams is far from representing the product of free association, pure and simple; it is produced by a feeble, fragmentary, ideative association on which is imposed the product—fantastic, but richly coloured with realism—of hallucinations on the one hand, and, on the other, the senseless product of purely phonetic verbal associa-

tions." November: A. A. Mendis-Corrêa on "Le Milieu Geographique et la race" will interest social psychologists and anthropologists. Among the reviews may be noted those of Bianchi's "La meccanica del cervello," and Schleiter's "Religion and Culture." December: M. Carrara has a very interesting critical note on "The Theory of Evolution in Neuropathology," in which he reviews the work of Brouwer, Muck, Gierlich, Negro, Zeehandeloor, and others, which has shown that on both the organic and functional sides the processes last acquired (whether considered phylogenetically or ontogenetically) are the least stable and the most liable to disease or to neurotic suppression (*e.g.*, speech, hearing, the abdominal reflexes and horizontal nystagmus)

The British Journal of Psychology (Medical Section) for July, 1921 (double number), contained the following:—"La Tension Psychologique, ses Degrés, ses Oscillations," by Pierre Janet, being three lectures delivered before the University of London. J. C. Flügel, "On the Biological Basis of Sexual Repression and its Sociological Significance," discusses the antagonism between Individuation and Genesis, and shows that this applies to the human race. On the psychological side the sexual instincts correspond to Genesis and their sublimations to Individuation. The sexual inhibitions have been imperfectly realised for reasons which are given. The whole constitutes an interesting and vigorous plea for birth-control methods. W. Whately Smith has two papers on "Some Properties of Complex Indicators" and "Complex Indicators and the Form of the Association." By means of the word association test and using the psycho-galvanic reflex, reaction-time and reproduction test as indicators, and identifying the nature of the concomitant affective tone by means of previously described memory tests, he determines the affective significance of the various possible combinations of complex indicators and the various classes of association responses. With regard to the latter, he gives reasons for adopting a system of classification slightly different from that of Jung. Millais Culpin discusses "The Problem of the Neurosthenic Pensioner," and T. W. Mitchell writes on "Psychology and the Unconscious," with especial reference to the various meanings which have been attached to the latter word. The October number contains several important papers. W. Langdon Brown writes on "The Influence of the Endocrines in the Psychoneuroses," and emphasises that "there is a close association between the sympathetic nervous system and the endocrine glands," which with the gonads "form a basic tripod entrusted with the defence of the individual and the continuity of the species." C. G. Jung, in "The Question of the Therapeutic Value of 'Abreaction'," considers the traumatic aetiology of war neuroses, and, dealing with abreaction, emphasises that "it is not merely the rehearsal of experience that possesses an unconditional curative effect, but rehearsal . . . *in the presence of the physician.*" The relationship of patient to physician is all important: "only in so far as they hamper present adaptation have [the infantile phantasy roots] any real significance": "an exclusively sexual interpretation of dreams and phantasies is a shocking violation of the patient's psychological material": the true superiority of the physician is essential. These are but landmarks, as it were, in a very fine paper by the eminent

leader of the Zurich school. E. Prideaux publishes a most valuable paper containing some of the results of his researches on "Expression of Emotion in Cases of Mental Disorder as shown by the Psychogalvanic Reflex." He reviews the meanings assigned to the term 'emotion,' and finally defines it as "a subjective feeling consisting of central excitement and consciousness of visceral sensations." He repudiates the James-Lange theory on the ground that a person feels emotion some time before visceral or even peripheral reactions are demonstrable—a criticism which seems of little weight, but which cannot be refuted here for reasons of space. He discusses the reservations subject to which the psycho-galvanic reflex may be rightly taken as a measure of the intensity of emotion, and, applying a carefully devised 'constant' method, he shows that most interesting differences are to be observed between persons suffering from various mental disorders. Healthy persons give the largest reflexes, and there come, in order, Anxiety states, Paranoid Dementia, Delusional Insanity, Conversion Hysteria, Manic-Depressive Insanity, Epilepsy, Dementia Præcox, Dements, Imbeciles, Idiots, and, lastly, General Paralytics, who give none at all. It is worth noting that a similar grading has recently been obtained by Hollingworth (*Psychology of Functional Neuroses*) using intelligence tests: a comparison of results would be interesting. Dr. Prideaux is to be congratulated on a fine piece of solid research work. W. S. Inman writes on "Emotion and Eye Symptoms"; and Constance Long contributes an analytical study of "Mary Rose."

The Journal of Educational Psychology. (November, 1921.) Harold Rugg asks the question, "Is the Rating of Human Character Practicable?" His answer is "Yes" if the rating is done under certain conditions which are not realisable in practice, but "No" if the question is one of rating with sufficient accuracy to be of practical use in education. A first instalment of detailed evidence, drawn from experience with the American Army tests and elsewhere, is given. Dr. A. A. Roback compares "Subjective *versus* Objective Tests," to the detriment of the latter. A. I. Gates concludes his study of "Reading and Reading Tests"; and J. W. Barton deals with "Smaller *versus* Larger Units in Learning to Typewrite."

Recent numbers of *Discovery* contain, as always, a great amount of matter of high general interest. Among articles of psychological relevance may be noted Mrs. R. H. Thouless' "Suggestion and Auto-suggestion (November) and Dr. Mariette Soman's "New Tendencies in French Fiction" (December).

The Journal of Abnormal Psychology and Social Psychology (July-September, 1921) has many interesting features. In particular we may mention Hocking's paper on "The Dilemma in the Conception of the Instinct," in which he maintains that "we can derive the whole set of behaviour phenomena in principle from the demands of consciousness; but we cannot in turn derive the fact, nor the need, of conscious life from the principles of the bodily organism and its world. Miss Spaulding's Presidential Address to the Association of Clinical Criminology at Columbus, Ohio, 1920, deals with "The Rôle of Personality Development in the Reconstruction of the Delinquent." Dr. G. T. Johnson contributes a very valuable "Survey of the Physiology of Contention." There are also papers

on "Revivalist Methods," the "Study of Repression," the "Fear of Actione," "Stammering," and "Dreams Psychology."

The Sociological Review (October, 1921) includes the final instalment of Prof. H. E. Barnes' very valuable survey of "American Psychology."

The British Journal of Psychology (General Section), October, 1921. Dr. Rivers on "Affect in the Dream"—the nightmare as a failure of wish-fulfilment; character of affect due to this failure; influence on affect of mental level action in the dream. P. B. Ballard: "The Limit of the Growth of Intelligence." Given a normal environment, a certain factor of intelligence—the power to integrate experience—arrives at maturity when the subject is sixteen years of age or younger. H. Hartridge continues his "Vindication of the Resonance Theory of Audition." B. Muscio on "The Importance of Feelings of Fatigue in Industry." T. H. Pear on "The Intellectual Respectability of Muscular Skill"; and a paper on "Marking Group Tests," by Charles Fox.

The Philosophical Review, Vol. XXX, No. 176. R. B. Perry on "The Appeal to Reason." J. W. Scott on "Psychology and Idealism." (No. 177). E. Noble makes an attempt to determine the Objective element in Æsthetics, and concludes, amongst other things, that "an enjoyment of music, in which æsthetic satisfactions culminate, may be regarded as an enjoyment of that which most completely imitates the universe process itself."

Beyond an interesting critical review of Dr. Bernard Hollander's "In Search of the Soul," there is nothing in *Science Progress* for October, 1921, of direct psychological importance. Professional psychologists (and others) will, however, be interested in the short account of the efforts which have been made by the National Union of Scientific Workers to secure abatement of Income-tax in respect of professional expenses incurred by scientists.

Zeitschrift für die gesamte Neurologie und Psychiatrie. Vol. LXXI. Otto Klieneberger: "On Simulation of Mental Disease."—Observations and conclusions drawn especially from the life of prisoners of war. Kurt Schmeider: "Remarks on a Phenomenological Psychology of Inverted Sexuality and Erotic Love."—Sexuality is not love; it is to be distinguished from erotic love also in the pathology of sexual life. Types of Sexuality are described. Vol. LXXII. Heinrich Lewy: "On Yawning." Gustav Aschaffenburg: "Remarks on the Project of a German Penal Code of 1919." Hans Toepel: "Psychology of Lesbian Love."—Three observations analyzed from the point of view of descriptive and exegetical psychology. E. D. Wiersma: "The Psychological Interpretation of Certain Reflexes." Describes modification of reflexes under the influence of different states of consciousness. Ernst Gellhorn: "The Relations of Tactile to Optic Space." Karl Tuczek: "Analysis of the Language of a Katatonic Patient."

Journal für Psychologie und Neurologie. Vol. XXVII. Nos. 1 and 2. Valentin Dumpert: "Contributions to the Study of the Nature and Physiological Significance of Yawning."

Archiv für Psychiatrie. Vol. LXIV. Nos. 1 and 2. Max Kastau: "Asocial Behaviour of Mentally Abnormal Juveniles During and After the War." W. Jacobi: "On the Relations of Poetic Production to Hysterical Crepuscular States, Illustrated by Goethe's Productivity." Wern. H. Becker: "Paul Morphy, his one-sided endowment and his illness."—A pathographic study of the celebrated master of the chess-board, who, apart from his special genius, seems to have been more or less feeble-minded.

Internationale Zeitschrift für Psychoanalyse. Vol. VII. No. 3. S. Ferenczi: "Further Development of the 'Active Technique' in Psycho-analysis."—Introduction of educational measures, setting tasks, teaching resignation, etc., in psycho-analytic treatment. Georg Groddeck: "On the Psycho-analysis of the Organic in Man." —The unconscious makes use of organic symptoms as well as of neurotic. O. Pfister: "Plato as a Precursor of Psycho-analysis." Franz Alexander: "Metapsychological Considerations."—Observations on biological activity and the inhibitory function of consciousness. A. T. Westerman Holstijn: "Analysis of a Patient with Spasms of the Spinal Nerve." H. Nunberg: "Decrease of the conflict of libido in a case of Schizophrenia." Michael T. Eisler: "On Freud's New Paper: 'Tenseits des Lustprincips'."

Imago. Vol. II. Nos. 2 and 3. Frida Teller: "The Correlation between Psychic Conflict and Bodily Ailments in Schiller." It is shown how the repressed tendencies and the conflicts arising from them manifest themselves in the life and the work of the poet, and how many of his bodily sufferings are connected with those conflicts. Honorio F. Delgado: "The Beauty of the Eyes."—The affective interest in eyes is caused through association, the infant regularly seeing the mother's eyes in moments of maximal libidinous contentment. P. C. van der Wolk: "The Psycho-analysis of the Smoke-Sacrifice." Géza Roheim: "The Self" (Part II) continues the ethmological survey of facts, serving for a study of the evolution of the concepts 'self,' 'soul,' etc. The unity of a soul, belonging to the whole body, arises through the unification of partial tendencies under the influence of the 'Lustprincip.' Alfred Winterstein: "The Collector." A study of a novel by V. Fleischer. Géza Dukes: "Psycho-analytical Points of View in the Juridical Interpretation of 'Guilt'." Carl Müller Braunschweig: "Psycho-analytical Contributions to the Psycho-genesis of Morals, especially of the Moral Act."—The origin of moral tension and norm is to be found in the narcistic formation of ideals. Melanie Klein: "The Development of a Child."—A highly documented study of the mentality of a young boy, with remarks on the rôle of psycho-analysis in education. Géza Roheim: "The Self" (Part III, Eidolon).—Eidolon signifies one's shadow or soul in Homer, etc. The study of the genesis of 'self' leads to a theory interpreting it as the result of a compromise between libido and resistance. The sum of libidinous tendencies (bodily soul) as the foundation of self-feeling is ejected as a second bodily self (eidolon, soul). The true cause of every ejection is always an inhibition, external (the adversary not being found, a picture must suffice) or internal (resistance, formed by the bipolarity of the tendencies). The ejected is the unconscious; the duality of the world, body and soul, arises out of the duality of the individual, of consciousness and unconsciousness.

Skandinavisches Archiv für Physiologie. Vol. XLI. Nos. 5 and 6. A. Apajalahti and A. Panelius: "The Influence of Bodily Fatigue on Precision-work."—Bodily work diminishes the faculty of threading needles; quantitative measurements. Hjalmar Ohrwall: "The Analysis of Sensory Impressions" gives a thoroughgoing discussion of the sensation-representation problem from a positivistic and physiological point of view.

Archiv für die gesamte Physiologie. Vol. CLXXXIX. Nos. 1–6. Hans Honigmann: "Studies of the Sensibility to Light and of the Adaptation of the Eye in Birds." Vol. CXC. Nos. 1–6. A. Kreidl and S. Gatscher: "Studies in Physiological Acoustics" II.—Experiments on a subject with deafness of one ear the 'Schwebungen' are perceived, are therefore of central origin.

Monatsschrift für Psychiatrie und Neurologie. Vol. L. Nos. 3–5. E. Popper: "Clinical Studies on the Genesis of Schizophrenia." Paul Schilder: "The New Trend in Psychopathology."—Remarks against any atomistic psychology; advocates a phenomenological point of view; psycho-analysis; the necessity of a central self. Erwin Strausky: "The new trend in psychopathology."—Denies any philosophical reflection in psychopathology, especially any psychology influenced by philosophical (phenomenological) tendencies.

Psychologische Studien. Vol. I. Nos. 1 and 2. 1921. A new periodical, to be issued irregularly, for psychology and allied sciences. Editors are: The psychologists—Prof. Koffka, of Giessen; Prof. Koehler, of Berlin; Docent Wertheimer, of Berlin. The psychiatrists—Prof. Goldstein, of Frankfurt, a.M., and Prof. Gruhle, of Heidelberg. Publisher: Julius Springer, Berlin. W. Koehler: "The Psychology of the Chimpanzee."—A very interesting description of behaviour; the first four instalments are to be found in the Proc. of the Berlin Academy. Max Wertheimer: "Contributions to the Theory of form" ['Gestalt']. Diedrich Westermann: "Life and Death with the Kpelle in Liberia."—Primitive ideas on death and life after death. P. Cermaks and K. Koffka: "Studies on Phenomena of Motion and Fusion." (No. V of Koffka's studies on form, I–IV having appeared in *Zeitschr. f. Psychologie.*) Observation of motions in intermittent light. Erich M. von Hornbostel: "On Optical Inversion."—Inquiries into the psychological factors determining the convex or concave appearance of objects. Wilhelm Fuchs: "A Pseudo-fovea in Hemianopsia."—The point of clearest vision in hemianopsia is not necessarily identical with the projection of the macula, but depends upon psychological factors.

Zeitschrift für Psychologie. Vol. LXXXVII. Nos. 5 and 6. Antonin Prandtl: "Psychical Efficiency in Changing Dispositions." Studies on learning and retaining nonsense-syllabes, on tachistoscopic apprehension, optical memory, etc., in the normal condition and after rotatory vertigo. Hans H. Keller: "An Experimental Contribution to the Theory of Recognition," studied by learning pairs of syllabes and determining the influence of different factors on recognition. Imre Hermann: "On Formal Tendencies in Choosing." The influence of spatial position in a field (central or marginal); its dependence upon age.

Allgemeine für Zeitschrift Psychiatrie. Vol. LXXVII. Nos. 1–5. Leokadya Waldberg: "The Influence of Emotions on the Faculty of Remembering in Normal Adults, Children, and Insane."—Acoustic presentation. Normal persons remember only words touching on emotional (displeasing) complexes. Influence of complexes in Dementia præcox; none in Epilepsy. J. Berze: "Schizophrenia and Psychological Interpretations."—Polemizes against Bleuler. Ernst Less: "Experiments by the Method of Jakobsohn for the Examination of Sentiments."—A study on moral judgment in juvenile persons. Schob: "On Psychic Disturbances Consequent upon a Penetrating Lesion of Both Frontal Lobes by a Bullet."

Archiv für die gesamte Psychologie. Vol. XLI. Nos. 1 and 2. Aloys Müller: "Contribution to the Problem of Reference-surfaces of the Sky and the Stars." A. Kirschmann: "Lustre and Colour of Metals."—Takes up the work of *Philos. Stud.* (XI), and declares the phenomenon to be of a parallactic nature, one part of the light passing through and being reflected. Rudolf Beck: "Is the Modern Idea of the Beauty of Mountains Caused by a Change of Human Ideas of Beauty?"—The question is answered in the negative; only technical and social factors are of influence. Friedrich Grossart: "On Tachistoscopic Errors in Reading, with a Special Study of Emotional Influence and the Question of Objective and Subjective Types."—Emotions have a great influence on the subjective conviction and the content of the utterances; so have individual differences of psychical structure. Vol. XLI. Nos. 3 and 4. Martha: Moers: "A Study of Immediate Retention with Different Modes of Presentation, and the Total and Discreet Behaviour of Attention Indicated Thereby." R. Rudlowski: "A Casuistic Contribution to the Psychology of 'Aussage'."—Analyzing a complex fact; influence of emotions connected with an oath. Theophil Lehmann: "Psychology of Comparing Short Intervals."—Influence of 'constellation.' E. Czuber: "Theory of Linear Correlation." Wilhelm Wirth: "Reply to Czuber on Linear Correlation."—Discussion of some questions of probability raised by Wirth's new work on psychometrical theory. Maria Tittel: "Assimilation and Contrast in the Acoustic Sphere."—Intervals within an octave are subjected to assimilation; if the distance is greater than an octave, contrast prevails. Musical persons are exceptions. Auguste Fischer, Alexius Meinong, Anna Berliner: "Determination of Reliability in the Method of Relative Position, with Special Reference to the Study of Advertising." Anna Berliner: "Correlation Between Æsthetic Value and Recognition."—Pictures valued higher are more easily recognised.

Archivio Italiano di Psicologia. (Nos. 1 and 2, July, 1920.) A. Gemelli and his assistants, G. Tessier and A. Galli: "The Perception of Position and Displacements of the Body."—The very interesting researches described in this study were provoked by the necessity of determining the capacity of aviators to perceive the aeroplane displacements, and have had a practical application, but they have also a great theoretical importance. Besides a precise analysis of lateral, longitudinal, and rotary displacements and of tactile, articular, and muscular perception of movements (especially of the phenomena of complication by association of the sensations and representations of different fields), these researches necessitate

a revising of the theory of a special 'static sense,' considered to be localised in the ampullæ of the semi-circular canals of the ear, which are supposed to receive excitation from the weight of the endolymph (theory of Goltz, Mack, Crum Brown, Cyon, Breuer). They prove, on the contrary, that the origin of this sense is very complex and results from the combination of various elements. It is determined by sensations of various organs according to different movements and displacements (tactile, muscular, articular, and tendinous sensations). The ampullæ of the labyrinth give a sufficient explanation only in the case of the perception of rotatory movements of the body. V. Roncagli describes experiments on faculties of apprehension by the labyrinth method. G. A. Elrington: "The Expression of Musical Intervals" (experimental research).—The result of the experiments is as follows:—There is a noticeable uniformity in expressions, which serve to characterise the different intervals. The expression does not merely relate to subjective experience, but is something that the subject perceives in the interval itself. This objective character or 'expressivity' of the interval is most clearly recognised in the following intervals:—Both seconds, the seventh, the octave, and the ninth.

Archivio Italiano di Psicologia. (No. 3, January, 1921.) F. Kiesow: "Observations on the Relation Between Two Objects Seen Separately by Two Eyes."—The first problem treated in these experiments is the explanation of the phenomenon, called by the author *subjective transparence*, which occurs when a distant object is seen through a near object put before one eye; it is explained as a case of the phenomenon known as rivalry between the visual fields of two eyes. Secondly, Kiesow answers affirmatively the much-discussed problem (cp. Haldat, Helmholtz, Hering) on the possibility of binocular mixture of colours, and establishes many laws of this phenomenon. Its explanation, according to the author, is not only of a physical nature, but also psychical, being in effect the principle of psychical fusion. Studying the problem of stereoscopic brightness, Kiesow, in opposition to Dove, Rood, Reute, and others, concludes that it is a product of a synthesis by the mind, conceived in the Wundtian sense. The phenomena of binocular contrast lead the author, in opposition to Ebbinghaus, to the conclusion that binocular contrast represents a distinct category, which follows, in general the laws of common contrast. M. Ponzo has studied the measurement of the course of the processes of denomination and recognition by means of respiratory graphs, and concludes that by means of respiratory curves it is possible to measure directly the duration of partial mental processes included in complex ones.

Rivista di Psicologia. (January-March, 1921). G. Tarozzi: "Philosophy, Science, and Psychology."—The author maintains that psychology must be the basis of education, against the idealistic tendency of Croce, Gentile, and Lombardo-Radice, which is now much in vogue in Italy. He affirms that education is to be founded upon philosophy conceived as a science of pure spirit—distinct as regards both method and scope from all natural and empirical sciences, to which category psychology also belongs. O. Decroly gives an outline of the programme adopted in an experimental school. A. Delmenico describes experiments on reading performed

in elementary schools of Canton Ficino. R. Serafini: "The Genesis of Crime in the Light of Modern Psychology."—The author maintains that the significance of the abnormality of the delinquent has been exaggerated, and that the greatest contribution to the study of criminality is to be expected from normal individual psychology. The origins of a single crime are manifold and complex, and the habits acquired under the influence of environment appear to be the prevailing factor in criminality. G. C. Ferrari is glad to communicate that in Milan Salvoni has founded a 'School of Spontaneous-Activity Education' with the purpose of applying to education the contributions of affective and genetic psychology. E. Bonaventura: "Sight and Touch in the Perception of Space" (1–3, January-September). These interesting experiments not only throw light on one of the more notable and controversial points of the problem of space perception, but also contribute to the study of the constructive activity of thought and imagination. Bonaventura has investigated tactile-motor-visual association in the perception of dimensions and forms—that is to say, in the principal determinations of space perception. His experiments prove that the tactile-motor data are not capable of furnishing a precise basis for space judgments of form, magnitude, and direction. The tactile-motor-visual association of space data is dependent on antecedent experience, and is variable from individual to individual. Tactile-motor space judgments are different from visual space judgments as regards identity of extensions, direction of lines, estimation of empty spaces, etc. In the transcription of dimensions the prevalent tendency is to diminish them. The experiments prove the original radical difference between the two sets of space concepts, and thus tend to refute the Kantian theory of space.

Archivio Generale di Neurologia, Psichiatria e Psicoanalysi has for its principal item a long and exhaustive paper on "The Internal Secretions and the Nervous System," by Laignel-Lavastine. A short paper by Luigi Zanon Dal Bò on "Whether There are Special Forms of Psychosis Caused by the War" is followed by an extensive bibliography of 214 Italian publications on the subject.

The Journal of Comparative Psychology (October, 1921) has four original papers. Yerkes describes "A New Method of Studying the Ideational Behaviour of Mentally Defective . . . Individuals," depending on the use of an electro-mechanical 'multiple-choice' apparatus. S. Bent Russell discusses the "Evolution of Nerve Muscle Mechanisms," starting from the most elementary physico-chemical conceptions. Colin P. Stone describes an investigation of the threshold of "Brightness Discrimination in the Dog." In one case he obtained a value of about 0.14 c.p. in 1.0 c.p.; in another of about 0.2. The lowest values for which evidence of discrimination was obtained were about 0.12 and 0.10 respectively. He finds that human subjects "can discriminate much smaller differences than the dogs could be trained to discriminate." Atkins and Dashiell write on "Reactions of the White Rat to Multiple Stimuli in Temporal Orders."

Journal de Psychologie (1921). January—Fr. Paulhan: "Sur le Psychique inconscient."—The author admits the existence of an unconscious psychicism and of infinite degrees of consciousness and

subconsciousness. He thinks that consciousness does not change the essential nature of the psychic phenomena: a love which ignores itself, however, *is* love. He conceives the mind as a system of tendencies, and the conscious and unconscious psychic phenomena are but signs of the activity of these tendencies. Dr. G. Dumas: "Le Rire."—Laughing may be considered from five different standpoints: (i) The anatomo-physiological mechanism of laughing; (ii) laughing as expression of joy; (iii) laughing as expression of the comic; (iv) why does the comic make us laugh? (v) how and why has laughing become a language? Dr. H. Wallon: "La conscience and la conscience du moi."—It is an error of introspection which makes us believe that consciousness implies the consciousness of self. The notion of self appears very late in psychological evolution, as we may see in observing children and mental defectives, and is very fragile: our representations and psychic actions have a virtual orientation in Space, which is revealed whenever the feeling of self weakens: when recovering from a swoon there is no consciousness of the self as such, our consciousness is diffused in our external sensations and perceptions; hallucination is but an exteriorized thought; certain insane persons complain that their thought is stolen from them, that *they* do not act their own actions. In such cases of regression there is no opposition between self and not-self. The place occupied by Space in consciousness is the more prevalent as the consciousness is more primitive. By a supreme abstraction the self stands out of Space, and then pretends to absolute identity and independence. February—H. Delacroix: "De l'automatique dans l'imitation." P. Janet: "Les oscillations de l'activité mentale." E. Rabaud: "Contributions à l'étude de l'instinet: comportment de quelques arraignées."—When a spider is attracted (*e.g.*, by a bee falling on the web) and repulsed by another insect bigger than itself, we might suppose that it is manifesting intelligent behaviour. But the attraction is a mere reflex response to the vibrations of the web, if they are of the proper intensity, but if these vibrations grow too strong the spider is repulsed. This anti-finalistic point of view can be verified by placing on the web a vibrating tuning-fork instead of a living bee: according to the violence of the vibrations and to the size of the spider, the latter is attracted, immobilized, or repulsed. The author, after some analogous observations on other insects, concludes that we must change all our notions, both on Instinct and Intelligence. March—E. Claparéde: "L'orientation lointaine." W. Boven: "Caracterè individual and alienation mentale." April—J. P. Pawlow: "Sur le centre de la faim." Dr. G. Revault d'Allonnes: "Le Méchanique de la pensée."—If it is true that the data of the senses are but mere outlines, general figures, and not 'images,' a new Psychology must therefore ensue, and the author suggests the replacement of the old Psychology of Taine based upon images by a Psychology based upon 'schemes.' Dr. G. Dumas: "Les Mouvements volontaires."—The delusion of will conceived as a power of absolute beginning comes from the disproportion between the *cause* of the voluntary movement, which is but a very slight tendency, much weaker than in the passional movements, and the *effect*, which may be a very complex action. This disproportion between the cause and the effect is explained by the automatism of the motor mechanisms, for the mere fact of saying "I will" is not able in the least to produce a single voluntary movement. In spite of the

delusion, the voluntary movements are but conditional reflex, and volition is nothing but the intellectual feeling accompanying these reflexes. June—E. Rabaud: "L'instinct maternel chez les mammifères."—The following observations have been made chiefly upon mice:—The maternal instinct (*i.e.*, the attraction of the female towards the little ones) is a kind of chemical reflex. This instinct results from internal secretions, and can be provoked experimentally by injecting the product of these secretions into a young mouse which previously showed no attraction at all towards the new-born babies of her comrades. July—P. Masson-Oursel: "Doctrines et Methods psychologiques de l'Inde."

Revue Philosophique (January, 1921). H. Beaunis: "Les Aveugles de Naissance et le monde exterieur." March-April, 1921—Dr. H. Wallon: "le Problème biologique de la conscience." It is only through the collective representations derived from the customs, language, literature, etc., of his group or nation that the individual consciousness can reach its inner processes. Introspection, therefore, does not give an adequate account of the psychic realities. The psychologist must not study the content of consciousness, which is of a super-individual origin, but should leave this task to the sociologist; the subject of his studies must be the organisation, progress, and mutual relationship of the mental functions, and his method that of the physicist. May-June—E. Raband: "L'Adaptation et l'Evolution"[1]. A very remarkable article, characteristic of the Mechanistic School. (i) The adequacy of the organism to the milieu in which it is living is generally recognised as a fact. Discussions arise only about the nature of this harmony, between the religious school who are content to wonder at the "marvels of Nature," the Darwinians, and the Neo-Lamarckians. (ii) But the strict adequacy of the organism to its milieu is a delusion. Seeing the organisms live and multiply, we suppose them to be in the best conditions, and each morphological detail to have a definite and necessary rôle in the adaptation. There is, of course, concordance to some extent, otherwise the organisms could not live, but the fact that in the same species all the individuals are not anatomically identical (*e.g.*, there are aquatic animals without fins), and that this difference does not interfere in the least with their life and development, shows that the rôle of morphology has not for the adaptation the vital importance we might have supposed. (iii) Adaptation as a physiological process: Metabolism constitutes essentially the conditions of existence. The external influences (temperature, humidity, etc.) make the metabolism possible or impossible. When it is possible the organism is adapted; when it is impossible the organism dies. Morphology has no active rôle in adaptation, but simply results from the metabolism. All naturaliste agree with this statement in so far as monocellular organisms only are concerned. But it is also true for the multicellular beings. The author, who is a distinguished zoologist, supports his theory with many and interesting instances. G. Poyer: "La Psychologie des caracterès.—The author gives his definition of the word 'character': the psychological individuality. He then gives an

[1] This article and some others will shortly appear in book form under the same title.

account of the classifications which have been proposed, and of the various methods used for the study of individual differences. Finally, he concludes that psychic individuality results from two factors: (i) an innate and hereditary datum; (ii) the acquired character which is framed up by physical and social influences and by the personal will of the individual working upon the innate character and modifying it. July-August—Fr. Paulhan: "Le perception de la synthése psychique." H. Piéron: "La notion des centres coordinateurs cérebraux et le mécanisme du langage."—M. Piéron gives an historical account of the various theories of Aphasia, and then concludes that the progress of our knowledge in cerebral localizations is unquestionable, and that this progress will continue until we shall try to localize not imaginary "Faculties," but psycho-physiological processes. November-December — Dr. Revault d'Allonnes: "Les schèmes presentés par les sens."

La Nouvelle Revue Française (July) contains two contributions of psychological interest. M. Jules Romains (whose claims to have established the existence of 'La Vision Extra-rétinienne' were summarised in the April issue of the *Psychic Research Quarterly*) offers an Introduction to a course of poetical technique; while M. Albert Thibaudet discusses the Unanimist movement and M. Jules Romains.

L'Esprit Nouveau (Nos. 7–12) has published a variety of articles by Basch Lalo and other writers on æsthetics in relation to modern Art. A convincing series of studies on the degradation of modern Architecture shews why the modern engineer is so often superior to the architect in the effects which he produces.

Books.

G. Dwelshauvers: "Le Psychologie française contemporaine." (Paris: Alcan, 1920, 1 p.-16.)

P. Fanconnet: "La Responsibility (étude de sociologie."

D. Parodi: "Le Problème moral and le pensée contemporaine."

P. E. Cornellie: "Le Survivance de l'àme and sou évolution après le mort."

Fr. Paulhan: "Le Mensouge des monde." "Les Transformations Sociales des Sentiments."

A. Longuet: "L'origine Commune des religions."

E. d'Eichtal: "On rôle de la me'morie dans nos conceptions metaphysiques, ethetiques, persionnelles, actives."

Dr. E. Osty: "Le Sens de la vie humaine."

ALSO RECEIVED.

(Mention under this heading does not preclude subsequent review.)

The Psychology of Thought and Feeling. By Charles Platt. (Kegan Paul, 7/6.)

A Treatise on Probability. By John Maynard Keynes. (Macmillan, 1921, 18/-.)

The Neurotic Constitution. By Albert Adler. (Kegan Paul, 18/-.)

Essays in Critical Realism. By DURANT DRAKE and others. Macmillan, 1921, 10/-.)

The Man from the Other Side. By ADA BARNET. (Allen and Unwin, 7/6.)

The Care of the Adolescent Girl. By PHYLLIS BLANCHARD, Ph.D. (Kegan Paul, 7/6.)

The Psychology of Society. By MORRIS GINSBERG. (Methuen, 5/-.)

Joan of Arc. By R. B. INCE. **Prentice Mulford.** By EVA MARTIN. **Jacob Boehme.** By W. P. SWAINTON. (Rider, 2/- each.)

The Symbolism of Colour. By ELLEN CONROY, M.A. (Rider, 3/6.)

Psycho-Analysis, Sleep and Dreams. By ANDRE TRIDON. (Kegan Paul, 7/6.)

The Psychology of Medicine. By T. W. MITCHELL. (Methuen, 6/-.)

The Process of Man's Becoming. By "Quaestor Vitae." (Duckworth, 8/-.)

Psycho-Analysis. By R. H. HINGLEY. (Methuen, 6/-.)

The New Psychology and the Teacher. By H. CRICHTON MILLER. (Jarrolds, 6/-.)

The Psycho-Analytic Study of the Family. By J. C. FLUGEL. (Allen and Unwin, 10/6.)

Pathology of the Nervous System. By E. FARQUHAR BUZZARD and J. GODWIN GREENFIELD. (Constable, 30/-.)

Radiant Motherhood. Married Love. Wise Parenthood. By MARIE C. STOPES. (Putnam, 6/- each.)

The Control of Parenthood. Edited by Sir JAMES MARCHANT. (Putnam, 6/-.)

The Gain of Personality. By W. CHARLES LOOSMORE. (Murray, 6/-.)

Woman and Marriage. By MARGARET STEPHENS. (Fisher Unwin, 6/-.)

The Education of Behaviour. By I. B. SAXBY. (University of London Press, 6/-.)

Dreams and the Unconscious. By C. W. VALENTINE. (Christophers, 4/6.)

The Sociological Determination of Objectives in Education. By DAVID SNEDDEN. (Lippincott, $2.50.)

Mountain Pathways. By HECTOR WAYLEN. (Kegan Paul, 3/6.)

The Law of Laws. By BERNARD TEMPLE. (Kegan Paul, 3/6.)

The Hidden Self. By H. ERNEST HUNT. (Rider, 4/6.)

The Philosophy of Nature Cure. By CLEMENT JEFFREY, M.A. (Daniel, 5/-.)

Revue de l'Ere Nouvelle. Vol. I. No. 2.

Theosophy in England and Wales. Vol. I. No. 11.

Journal of the American Society for Psychical Research

Journal of Comparative Psychology. Vol. I. Nos. 1, 2, 3, 4.

The Twentieth Plane. No. 5.

Etc., etc.